



# FINANCIAL STABILITY REPORT

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September 2015

*Banco de la República*  
Bogotá. D. C., Colombia

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# CONTENT

Executive Summary	9
I. Macroeconomic Environment	13
II. Vulnerabilities of the Financial System	19
A. Current Situation of the Financial System	19
B. Credit Risk	25
C. Market Risk	41
D. Liquidity Risk	43
Box 1: Identification of Significantly Important Conglomerates in Colombia	47
Box 2: Interest Rate Risk of the Banking Book of Credit Institutions in Colombia	53
Box 3: Incorporation of Resources to the National Account and Liquidity of the Financial System	58
III. Sensitivity Tests	62
A. Static Sensitivity Tests	62
B. Dynamic Sensitivity Test	68
Box 4: Private Debt Market Risk	75
Box 5: Counter-Cyclical Capital Buffer and Dynamic Provisions in Colombia: Elements For an Assessment of their Joint Existence	76
Box 6: Islamic Finance: Basic Features	79
IV. Financial Regulation	82
Box 7: Factoring in the Real and Financial Sectors in Colombia: Regulation and Characterization	88

# GRAPHS

Graph 1	Annual Real Economic Growth	14
Graph 2	Federal Funds Rates Expectations	14
Graph 3	Commodities Price Indexes	15
Graph 4	Financial Indicators	16
Graph 5	Colombia Spot Curve	17
Graph 6	Annual Real Growth Rates of Loan Portfolio Modalities	20
Graph 7	A. Quality Risk Indicator	21
	B. Default Risk Indicator	21
Graph 8	Type of Investment of Proportion of Total Investment	22
Graph 9	Composition of Liabilities of Credit Institutions	22
Graph 10	Non-Banking Financial Institutions Investment Portfolio Composition	24
Graph 11	Financial Debt of the Private Corporate Sector as a share of GDP. by Instrument	26
Graph 12	Financial Debt of the Private Corporate Sector as a share of GDP. by Currency	26
Graph 13	Private Corporate Sector Loan Portfolio Balance Composition. by Economic Sector	29
Graph 14	Credit Risk Indicators by Economic Sector	30
Graph 15	Non-Performing Loan Indicator by Economic Sub-Sector	31
Graph 16	A. Distribution of Fragile Firms by Interest Hedging Index	32
	B. Debt at Risk Distribution by Interest Hedging Index	32
Graph 17	Commercial Loan Portfolio Concentration	33
Graph 18	Loan Portfolio of Fragile Firms as a Share of the Loan Portfolio of each Economic Sector as of December 2014	34
Graph 19	Credit Risk Indicators	34
Graph 20	Credit Risk Indicator by Sectors: Fragile Companies	34
Graph 21	Proprietary Position of Foreign Exchange-Market Intermediaries	35
Graph 22	Exposure of the Financial System to Vulnerable Companies facing a Depreciation	36
Graph 23	Credit Risk Indicators for the Analyzed Groups	37
Graph 24	Household Debt Composition and Annual Real Growth	38
Graph 25	Household Expectations Indexes	39
Graph 27	Households Financial Burden	40
Graph 26	Non-Performing Loan Indicator for the Main Categories of the Consumer Loan Portfolio	40
Graph 28	Households Financial Burden (CFI) based on Information from CIFIN	41

Graph 29	Duration of the Debt Portfolio	43
Graph 30	Credit Institutions Deposits-to-Loan Portfolio Ratio	43
Graph 31	Composition of Bonds Issued by Credit Institutions: Outstanding Balance at Maturity	44
Graph 32	Nominal Balance of Credit Institutions Investments in Public Debt Securities	44
Graph 33	Liquidity Risk Indicator	45
Graph 34	Financial Fragility Indicator	45
Graph 35	Rolling of the Total Loan Portfolio in the Hypothetical Scenario	70
Graph 36	Capital Adequacy Ratio of the Financial System	72
Graph 37	Capital Adequacy Ratio by Group of Entities	73
Graph 38	Risk-Weighted Assets (RWA) of the Financial System Growth Rate	74
Graph 39	Profits of the Financial System	74
Graph 40	Countercyclical Provisions of the Financial System Reserve Size	74

## TABLES

Table 1	Real Annual GDP Growth by Economic Activity Sectors: Seasonally Adjusted Series	17
Table 2	Non-Banking Financial Institutions Proprietary and Third-Party Assets	23
Table 3	Financial Indicators of the Private Corporate Sector - December 2014	27
Table 4	Vulnerable Firms due to Devaluation of their Equity facing a 40% Depreciation of the Colombian Peso and their Representativeness in the Commercial Loan Portfolio	37
Table 5	TES Share (in Colombian pesos and Real Value Units), Financial Institutions Private Debt Securities and Shares Exposed to Market Risk	42
Table 6	Losses Due to Devaluation in the Debt and Local Shares Portfolio	64
Table 7	Static Stress Test: Results on the Solvency of Credit Institutions	66
Table 8	Static Stress Test: Results on the Return on Assets (ROA) of Credit Institutions	66
Table 9	Effects of the Market and Credit Risks Shock in the Liquidity Risk Indicator of Credit Institutions	68



## NOTE TO THE READERS

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From this edition, the Financial Stability Report will have fewer pages with some changes in its structure. The purpose of this change is to present the most relevant facts of the financial system and their implications on the financial stability. This allows displaying the analysis more concisely and clearly, as it will focus on describing the evolution of the variables that have the greatest impact on the performance of the financial system, for estimating then the effect of a possible materialization of these risks on the financial health of the institutions.

The changing dynamics of the risks faced by the financial system implies that the content of the Report adopts this new structure; therefore, some analyses and series that were regularly included will not necessarily be in each issue. However, the statistical annex that accompanies the publication of the Report will continue to present the series that were traditionally included, regardless of whether or not they are part of the content of the Report. In this way we expect to contribute in a more comprehensive way to the study and analysis of the stability of the Colombian financial system.





# EXECUTIVE SUMMARY

During the first half of 2015, the main advanced economies showed a slow recovery on their growth, while emerging economies continued with their slowdown trend. Domestic demand in the United States allowed for stabilization on its average growth for the first half of the year, while other developed economies such as the United Kingdom, the euro zone, and Japan showed a more gradual recovery. On the other hand, the Chinese economy exhibited the lowest growth rate in five years, which has resulted in lower global dynamism. This has led to a fall in prices of the main export goods of some Latin American economies, especially oil, whose price has also responded to a larger global supply. The decrease in the terms of trade of the Latin American economies has had an impact on national income, domestic demand, and growth. This scenario has been reflected in increases in sovereign risk spreads, devaluations of stock indices, and depreciation of the exchange rates of most countries in the region.

For Colombia, the fall in oil prices has also led to a decline in the terms of trade, resulting in pressure on the dynamics of national income. Additionally, the lower demand for exports helped to widen the current account deficit. This affected the prospects and economic growth of the country during the first half of 2015. This economic context could have an impact on the payment capacity of debtors and on the valuation of investments, affecting the soundness of the financial system. However, the results of the analysis featured in this edition of the Report show that, facing an adverse scenario, the vulnerability of the financial system in terms of solvency and liquidity is low.

The analysis of the current situation of credit institutions (CI) shows that growth of the gross loan portfolio remained relatively stable, as well as the loan portfolio quality indicators, except for microcredit, which showed a decrease in these indicators. Regarding liabilities, traditional sources of funding have lost market share versus non-traditional ones (bonds, money market operations and in the interbank market), but still represent more than 70%. Moreover, the solvency indicator remained relatively stable. As for non-banking financial institutions (NBFI), the slowdown observed during the first six months of 2015 in the real annual growth of the assets total, both in the proprietary and third party position, stands out.

The analysis of the main debtors of the financial system shows that indebtedness of the private corporate sector has increased in the last year, mostly driven by an increase in the debt balance with domestic and foreign financial institutions. However, the increase in this latter source of funding has been influenced by the depreciation of the Colombian peso *vis-à-vis* the US dollar since mid-2014. The financial indicators reflected a favorable behavior with respect to the historical average, except for the profitability indicators; although they were below the average, they have shown improvement in the last year. By economic sector, it is noted that the firms focused on farming, mining and transportation activities recorded the highest levels of risk perception by credit institutions, and the largest increases in default levels with respect to those observed in December 2014. Meanwhile, households have shown an increase in the financial burden, mainly due to growth in the consumer loan portfolio, in which the modalities of credit card, payroll deductible loan, revolving and vehicle loan are those that have reported greater increases in risk indicators.

On the side of investments that could be affected by the devaluation in the portfolio of credit institutions and non-banking financial institutions (NBFI), the largest share of public debt securities, variable-yield securities and domestic private debt securities is highlighted. The value of these portfolios fell between February and August 2015, driven by the devaluation in the market of these investments throughout the year. Furthermore, the analysis of the liquidity risk indicator (LRI) shows that all intermediaries showed adequate levels and exhibit a stable behavior. Likewise, the fragility analysis of the financial system associated with the increase in the use of non-traditional funding sources does not evidence a greater exposure to liquidity risk.

Stress tests assess the impact of the possible joint materialization of credit and market risks, and reveal that neither the aggregate solvency indicator, nor the liquidity risk indicator (LRI) of the system would be below the established legal limits. The entities that result more individually affected have a low share in the total assets of the credit institutions; therefore, a risk to the financial system as a whole is not observed.

**José Darío Uribe**  
Governor

# FINANCIAL STABILITY REPORT

Prepared by:

The Financial Stability Department  
**Monetary and International Investment  
Division**

Under the mandate granted by the Political Constitution of Colombia, and according to Act 31 of 1992, *Banco de la República* has the responsibility to ensure price stability. The proper fulfillment of this task crucially depends on maintaining financial stability.

Financial stability is defined as a situation in which the financial system efficiently intermediates financial flows, contributing to a better allocation of resources, thus maintaining macroeconomic stability. Therefore, financial instability directly affects the macroeconomic stability and *Banco de la República's* capacity of to fulfill its constitutional goal, which highlights the need to promote monitoring and the maintenance of financial stability.

The tasks that *Banco de la República* carries out in order to promote financial stability are the following: first, the Bank is responsible for ensuring the proper functioning of the payments system of the Colombian economy; second, the Bank provides liquidity to the financial system through its monetary operations and by its constitutional feature as lender of last resort; third, the Bank contributes, along with the Office of the Financial Superintendent of Colombia, and by its character as credit authority, to the design of financial regulation mechanisms that reduce the incidence of episodes of instability; finally, *Banco de la República* exercises a careful monitoring on the economic trends that may threaten financial stability.

The Financial Stability Report is framed within this last task and accomplishes two objectives: first, to describe the recent performance of the financial system and its main debtors in order to visualize the future trends of this behavior, and second, to identify the most important risks faced by credit institutions. Both objectives intend to inform the general public about the trends and risks related to the financial system as a whole.

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# I. MACROECONOMIC ENVIRONMENT

*In the first part of 2015, the advanced economies showed a slow growth rate, while the emerging ones continued registering slowdowns. The United States recorded a stabilization on its growth, aided by a recovery on its domestic demand, while China showed its lowest growth rate in five years, which resulted in a lower global dynamism. For its part, Colombia was affected by the weak external demand and lower oil prices, causing a decline in the terms of trade and pressure on the dynamics of domestic income. This affected the prospects and economic growth of the country during the first semester of 2015.*

During the first half of 2015, the major advanced economies showed a slow recovery on their growth, while the emerging ones continued their decelerating trend (Graph 1, panels A and B). In particular, the domestic demand in the United States allowed stabilization on its average growth of the first half of the year, while other developed economies such as the UK, the euro zone and Japan, showed a more gradual recovery. Meanwhile, China's economic growth was the lowest in the last five years, a behavior that has generated pressure on the dynamics of the main emerging economies. In fact, most Latin American countries recorded lower growth rates, which, together with the slowdown of the other developing economies, led to a weaker external demand and repeated declines in world growth projections<sup>1</sup>.

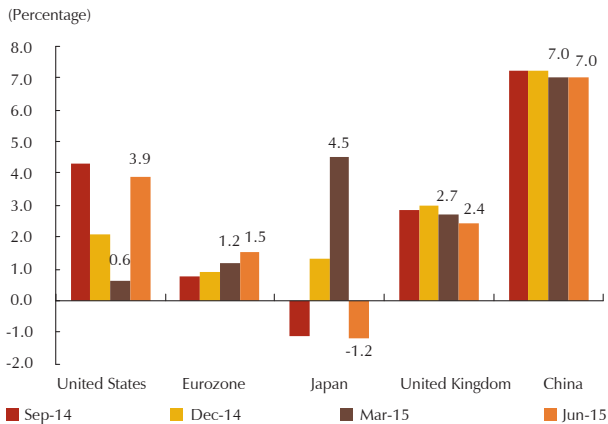
The stabilization in the United States and the United Kingdom growth rates during the period of analysis showed signs of a possible normalization of their monetary policy. In the first case, the improvement in the labor market and a growth that exceeded expectations by responding to a rebound in

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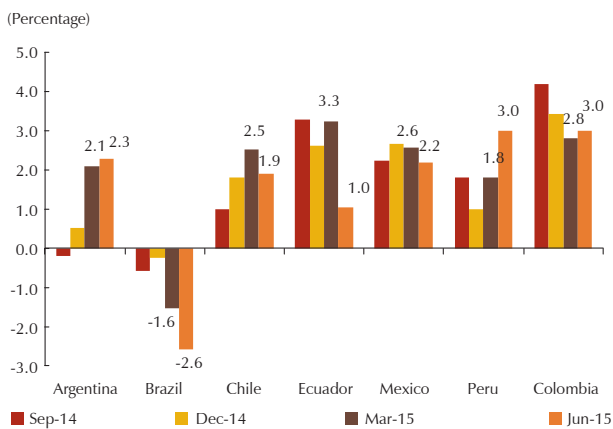
<sup>1</sup> The International Monetary Fund lowered twice its projections for global growth, passing from 3.5% in April, to 3.3% in July and 3.1% in October of 2015.

**Graph 1**  
Annual Real Economic Growth

**A. Main World Economies**

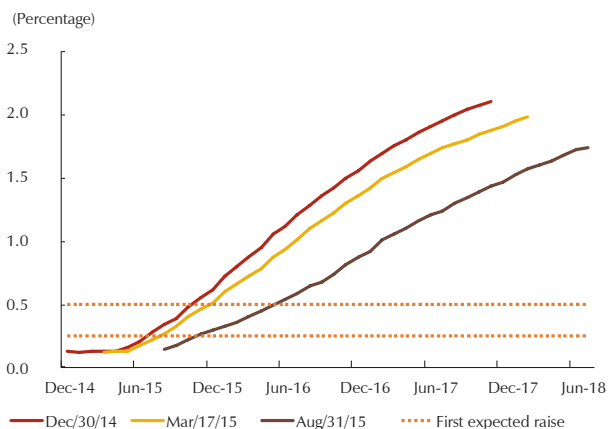


**B. Latin America**



Note: United States and Japan data correspond to the quarterly annualized growth.  
Source: Bloomberg.

**Graph 2**  
Federal Funds Rates Expectations



Source: Bloomberg.

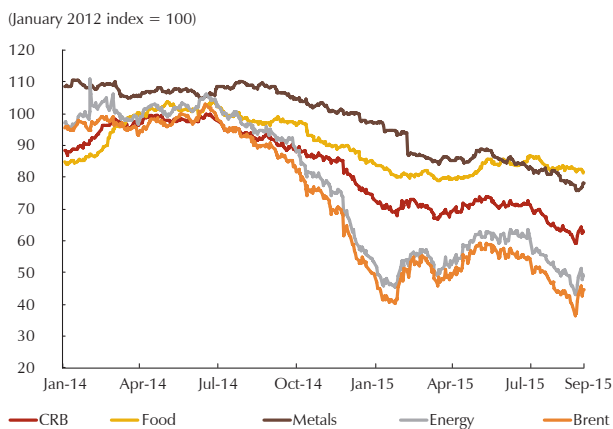
investment and in consumer spending provided hints to markets of the possible beginning of the normalization of the FED's monetary policy. Thus, the expectations about the federal funds rate showed that the first increase in the interest rate would begin between the end of this year and the beginning of the next (Graph 2). Yet, low inflationary pressures, accompanied by lower prices of commodities worldwide, along with lower global growth perspectives (especially for the weaker dynamic of China), generated uncertainty about the start and rate of increase of interest rates in the U.S. economy. In the case of the United Kingdom, according to the International Monetary Fund (IMF), a gradual recovery on its pace of growth generated higher expectations on the normalization of its monetary policy.

Meanwhile, the euro zone showed a gradual recovery in its growth pace, supported by an increase on its domestic demand and household consumption, along with a higher inflation. In this context of slow output growth, the monetary policy of the European Central Bank (ECB) remains being expansionary, and the current asset purchase program, which began in late 2014, remains one of the main tools to improve access to credit, for stimulating investment and to give support to economic growth. The uncertainty generated during the first half by political and economic risks in Greece, increased the volatility in the financial markets in Europe, but had no major impact on consumer confidence. With respect to Japan, its economy recorded an on average slow growth pace during the first half of the year and, according to the IMF, it is expected that its expansionary monetary policy is maintained in the short term, as it is also expected for the euro zone<sup>2</sup>.

<sup>2</sup> It is important to mention that during the period of analysis, the Standard & Poor's agency downgraded Japan, arguing that the strategy of economic drive, known as *Abenomics*, has not been enough to help the public accounts of the country and overcome deflation. The rating of long-term debt of the economy of Japan, went from AA- to A+.

Added to the uncertainty regarding the monetary policy of the major world economies, another factor of the greater impact on the global macroeconomic context was the ongoing weakness of emerging economies. Specifically, during the first semester of the year China showed its lowest growth rate in five years, due to a lower domestic demand and a reduction on its foreign trade. Faced with this economic slowdown, its central bank has cut its interest rates by 100 basis points (bp) so far in 2015, and has implemented other measures, such as the reduction in reserve requirements and foreign exchange measures<sup>3</sup>.

Graph 3  
Commodities Price Indexes



Source: Bloomberg.

This context of lower global dynamism has led to a fall in the price of the main exports of some Latin American economies (Graph 3), especially oil, whose price has also responded to factors of increased global supply, which has led that during the year its price has fallen at about 8%, accumulating a drop of 54% since June 2014. This effect of lower commodity prices has affected the terms of trade of the economies of Latin America, generating pressures on their national income and affecting, likewise, their domestic demand and growth. All of this has occurred in an environment of high inflation in most Latin American countries, and problems of economic sustainability and

political uncertainty in other countries in the region, such as Argentina, Brazil<sup>4</sup> and Venezuela, which maintain high levels of macroeconomic imbalances and minimum confidence levels. The external shock has also affected Ecuador, for which it has been more difficult to maneuver, given its status of a dollarized economy<sup>5</sup>.

This scenario has resulted in increases in sovereign risk spreads, devaluations of stock indices and depreciations of the exchange rates of most countries in Latin America<sup>6</sup> (Graph 4, panels A, B and C).

3 The Central Bank decided to depreciate its currency by 1.9% as a measure to support exporters and counter deflationary risks. Between the 10th and 11th of August, the foreign exchange rate went from 6.21 to 6.33 yuans per US dollar.

4 It is worth mentioning that Standard & Poor's lowered the credit rating of Brazil, given the political instability and the high level of indebtedness of the economy. The rating went from BBB- to BB+.

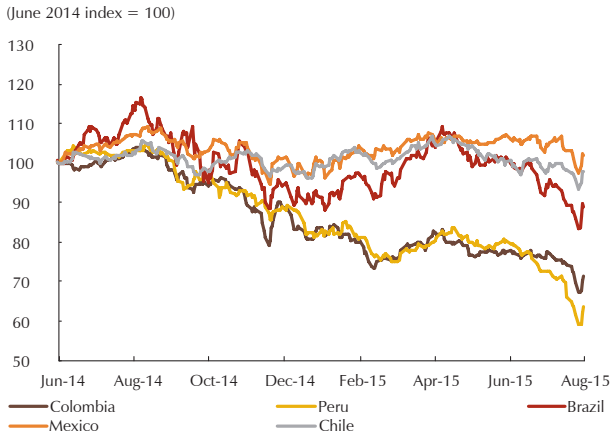
5 See: "*Perspectivas económicas: Las Américas, ajustando bajo presión*", International Monetary Fund, October 2015.

6 The LACI index shows the behavior of the currencies of the main countries of Latin America as follows: Argentinian peso (10%), Brazilian real (33%), Chilean peso (12%), Colombian peso (7%), Mexican peso (33%) and Peruvian sol (5%). The index shown in Graph 4, panel C, corresponds to 1/LACI, and is interpreted as the value of the U.S. dollar against the basket of currencies aforementioned; therefore, an increase corresponds to a depreciation of Latin American currencies *vis-à-vis* the dollar.

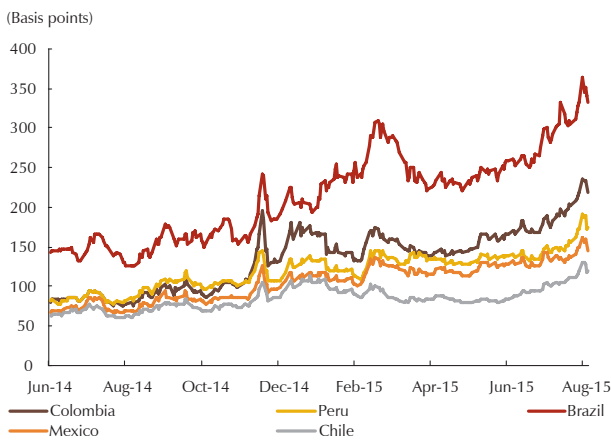


Graph 4  
Financial Indicators

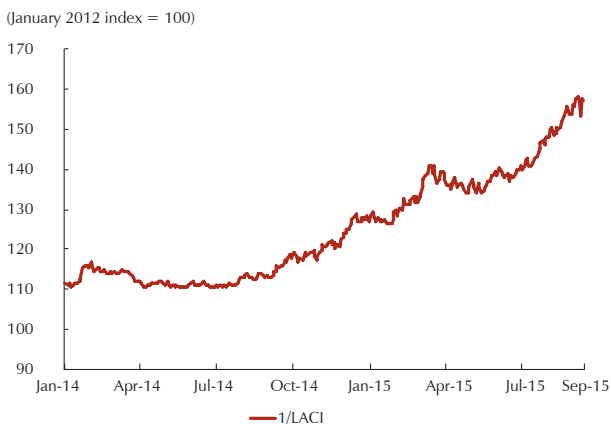
A. Stock Indexes for some Latin American Countries



B. Five-Year Credit Default Swaps (CDS) in some Latin American Countries



C. Currencies Index



Source: Bloomberg.

Colombia has been no exception to this situation. The drop in oil prices and in other of its main export commodities has generated a decrease in the terms of trade, which remain at their lowest levels since 2009, causing pressures on the dynamics of national income. As of June 2015, a 23.8% drop was registered in the terms of trade *vis-à-vis* the same month of the previous year. Also, a lower demand of exports due to the weak economic performance of several of its main economic partners<sup>7</sup> contributed to widen the current account deficit, which increased from 4.3% to 6.0% of GDP between June 2014 and the same month of 2015, from which 1.3 percentage points (pp) are explained by the effect of the depreciation of the Colombian peso in the measure of GDP in US dollars.

All of the above has affected the outlook<sup>8</sup> and the economic growth of the country so far in 2015. Thus, the real economic activity in Colombia grew at a 3.0% annual rate in the second quarter of 2015, continuing with the slowdown registered since mid-2014. Per economic sector, the good performance of construction (8.7%), trade (3.8%) and financial services (3.6%) stands out, although growth is lower in the last two cases, both in what was observed for the same quarter of 2014 as for that year's total. In contrast, transport, warehousing, and communications exhibited the largest slowdown, reaching almost no growth (0.5%), while industry was the only sector that contracted (-1.3%) (Table 1). This economic performance took place in a context of acceleration of inflation, partly explained by temporary weather

7 The trade partners of Colombia, according to the *Report on inflation*, are: the United States, the eurozone, Venezuela, Ecuador, Brazil, Peru, Mexico and Chile. While in the March report a growth for 2015 of 1.3% of the trade partners altogether was expected, it had been adjusted to 0.9% by June.

8 Indeed, taking into account these and other elements, the more likely growth forecasting was reduced from 3.2% to 2.8% between the March and June of 2015 *Report on inflation* issues.

**Table 1**  
Real Annual GDP Growth by Economic Activity Sectors: Seasonally Adjusted Series

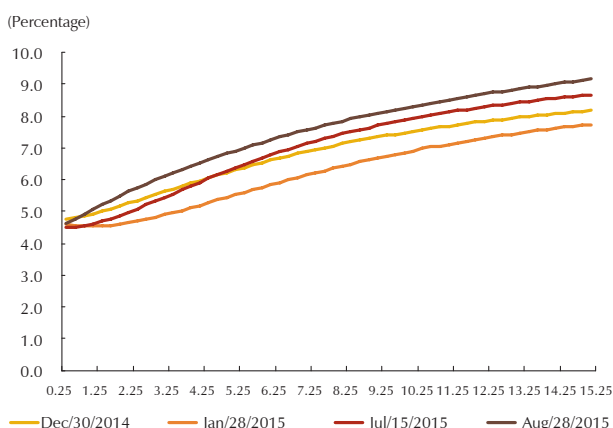
	2014		2015	
	Second Quarter	Full Year	First Quarter	Second Quarter
Agricultural, forestry, hunting and fishing	0.3	2.3	1.7	2.5
Mining and quarrying	-2.3	-0.2	0.5	4.2
Manufacturing industry	-1.6	0.2	-2.2	-1.3
Electricity, gas and water	3.8	3.8	2.3	1.6
Trade, warehousing and communications	8.7	9.9	4.7	8.7
Construction	4.2	4.6	5.0	3.8
Trade, repairs, restaurants and hotels	4.4	4.2	2.9	0.5
Financial, real estate, and companies' services	5.5	4.9	4.2	3.6
Social, communal, and personal services	5.5	5.5	3.0	2.5
GDP	4.2	4.6	2.8	3.0

Source: National Administrative Department of Statistics (*Departamento Administrativo Nacional de Estadística, DANE*).

phenomena which have affected food supply dynamics, and the pass-through of the nominal depreciation to consumer prices.

Regarding local financial markets, the behavior of the foreign exchange rate and the secondary public debt market is highlighted. As for the first case, an 8.1% nominal devaluation of the Colombian peso *vis-à-vis* the US dollar was observed during the first semester of the year, reaching 29.6% by the

**Graph 5**  
Colombia Spot Curve



Source: Electronic Negotiation System and Colombian Electronic Market (*Sistema Electrónico de Negociación, SEN; Mercado Electrónico Colombiano, MEC, respectively*); calculations by Banco de la República.

end of August versus the foreign exchange rate of December 31, 2014<sup>9</sup>. On their part, zero-coupon rates of public bonds (TES, for their acronym in Spanish) in Colombian pesos appreciated during the first month of the year as a result of global high liquidity expectations due to the monetary stimuli programs announced in 2014 for the euro zone and Japan. Nonetheless, devaluations caused by higher inflation expectations and concerns over the Colombian fiscal environment because of lower oil prices were registered for the remaining of 2015, added to the uncertainty about the beginning and pace of monetary normalization in the United States (Graph 5).

The devaluations in the markets mentioned above have also happened in the securities and private debt ones, with falls in the Colcap of 19.5% in the first half of the year and average increases of 11 bp, 49 bp and 104 bp in the short (one year), medium

<sup>9</sup> The depreciation between June 2014 and June 2015 was of 37.4%, while between August of both years it reached 61.6%.

(5 years) and long (10 years) sections of the reference curves for the private debt of Infovalmer, respectively<sup>10</sup>.

In this context, it would be expected that there are potential sources of risk associated with the effects of the future behavior of commodity prices, the trend of economic growth, weather phenomena as well as the exchange rate may have on the financial system debtors. This, together with the consequences that the behavior of inflation expectations and the increase in international interest rates may have on the value of the main assets of the investment portfolio of financial institutions, since, despite the registered depreciations, there is still uncertainty about the effects of the normalization of the monetary policy of the United States.

Therefore, in this edition of the Report, the analysis of the main risks the financial system faces, is focused on identifying the exposures that are more sensitive to an economic scenario as the one described, and on performing some stress tests that assess the potential vulnerability of the system in front of the possible occurrence of two shocks. First, a materialization of the credit risk of a specific set of debtors; second, a materialization of market risk in the portfolio of entities, associated with depreciations in the fixed income (public and private), and securities markets. The proposed stress tests consider the joint effect of these risks on various indicators of financial soundness of the institutions, and highlighted the importance of continuing with a careful monitoring of the financial situation of debtors and entities.

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<sup>10</sup> The figures reported correspond to the average change observed in the vertices for one, five and ten years between 19 January 2015 and 28 August of the same year in the following reference curves of *Infovalmer*: Banks AAA fixed simple and financial sector AAA fixed simple.

## II. VULNERABILITIES OF THE FINANCIAL SYSTEM

*Given the potential risks that have been identified in the macroeconomic environment, it is relevant to analyze and evaluate the level of exposure of the financial intermediaries before these potential sources of vulnerability. To meet this objective, this section provides an overview of the financial system and analyzes each of the risks (credit, market and liquidity) to which financial institutions are exposed to.*

*The analysis of the main debtors of the financial system shows that the private corporate sector has increased its indebtedness in the last year, influenced in part by the depreciation experienced by the Colombian peso vis-à-vis the US dollar since mid-2014. Households have presented an increase in the financial burden, with a higher growth in the consumer loan portfolio, on where the modalities of credit card, drawing, revolving and car loans are those that have reported greater increases in the risk indicators. Regarding market risk, the largest share of public debt, variable yield and domestic private debt securities in the investments of non-banking financial institutions is highlighted. The analysis of the liquidity risk indicator (LRI) shows that all intermediaries presented adequate levels and exhibit a stable behavior. Likewise, the fragility analysis of the financial system associated with the increased use of non-traditional funding sources, does not evidence a greater exposure to liquidity risk.*

### A. CURRENT SITUATION OF THE FINANCIAL SYSTEM

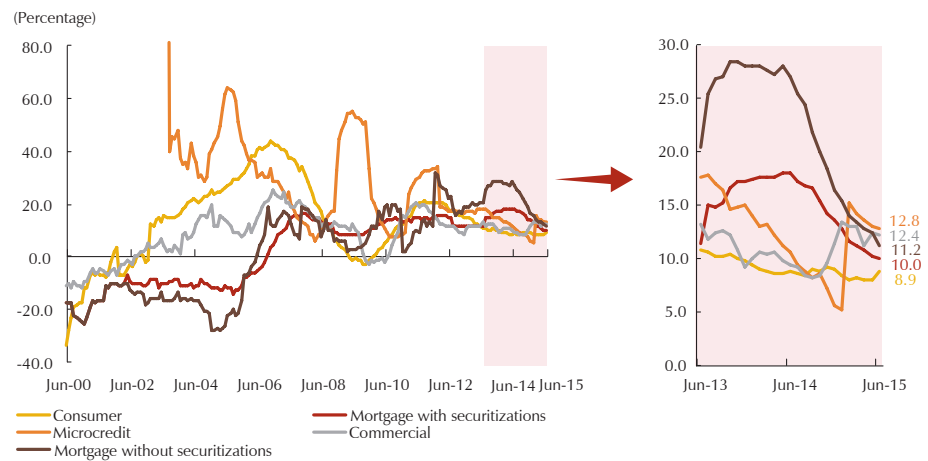
In June 2015, the assets of credit institutions (CI) presented an annual real growth rate of 9.4%, reaching \$ 511.8 trillion. This category consists mainly of loans (69.6%) and investments (19.9%). Meanwhile, the annual real growth of the total loan portfolio<sup>11</sup> was at 11.1%.

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<sup>11</sup> From January 2015, the Office of the Financial Superintendent of Colombia asked financial institutions to reclassify residential leasing from the commercial loan portfolio to the mortgage loan portfolio. Additionally, with the implementation of the International Financial Reporting Standards (IFRS), it was possible to classify certain operating leasing operations within the category of financial leasing, general provisions by modality were identified, and the loan portfolio of employees was included within the analysis of each loan portfolio. These changes affect all the indicators of the commercial portfolio, the amount of non-performing loans portfolio and of provisions of the mortgage loan portfolio, and the amount of provisions of the microcredit loan portfolio. Therefore, it is not considered appropriate to compare these indicators between 2015 and the previous years by modality of credit. Comparisons for the total non-performing loans portfolio and the risk one are considered valid.

The downward trend exhibited by the mortgage portfolio (with and without securitizations) in the last year, and the acceleration of the commercial and microcredit loan portfolios over the past six months<sup>12</sup> are highlighted (Graph 6). The gross loan portfolio with securitizations totaled \$ 356.4 trillion, in which the commercial loan portfolio continues to be the modality with the largest share (58.2%), followed by consumer (26.5%), mortgage with securitizations (12.4%) and microcredit (2.9%).

**Graph 6**  
Annual Real Growth Rates of Loan Portfolio Modalities



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

The behavior of the loan portfolio has been accompanied by the stability of the quality risk indicator<sup>13</sup> for all modalities, except for microcredit, which shows a decrease since December 2014 (Graph 7). On its part, the default quality indicator<sup>14</sup> shows an increase for the mortgage portfolio<sup>15</sup>, a decrease for microcredit<sup>16</sup>, and a stable behavior for the other modalities.

12 The commercial loan portfolio showed a higher growth rate, mainly due to three reasons: i) with the introduction of the IFRS, part of the operating leasing moved to this loan portfolio, by discounting this effect, the real annual growth of the commercial loan portfolio as of June 2015 is of 9.8%; ii) the depreciation recorded since July 2014, increased the balance of the loan portfolio in foreign currency, and iii) in the last year, there has been a decrease in the share of bonds as a source of corporate financing, which may be associated with an increase in the loan portfolio as a source of funding. On its part, the microcredit loan portfolio evidences a leap in its growth rate due to the arrival of *Banco Mundo Mujer* to the financial system.

13 Defined as the ratio between the risk loan portfolio and the total one (the risk loan portfolio corresponds to all credits with a grade other than A, on a scale from A to E, where A is the best).

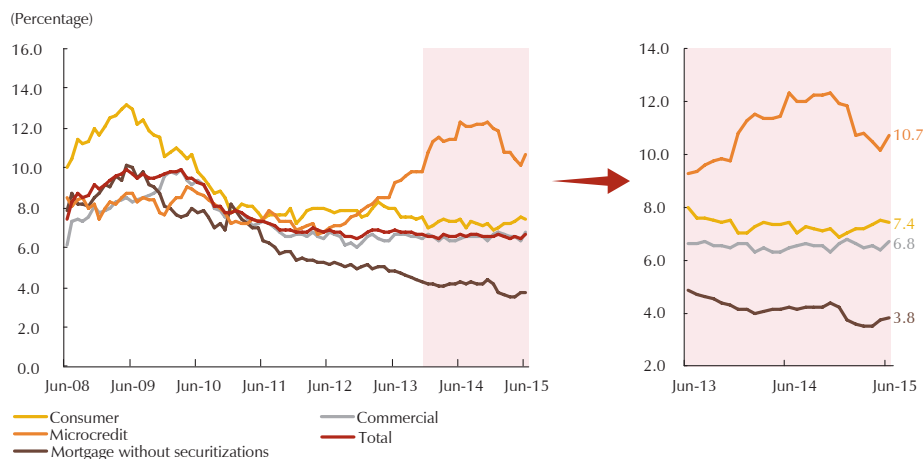
14 Calculated as the ratio between the non-performing loans portfolio and the total one (non-performing loans portfolio include loans that have defaulted for a period equal to or greater than thirty days).

15 With the introduction of the IFRS, the non-performing housing leasing, which was previously included in the default loan portfolio of the commercial modality, went to be allocated to the mortgage non-performing loans portfolio.

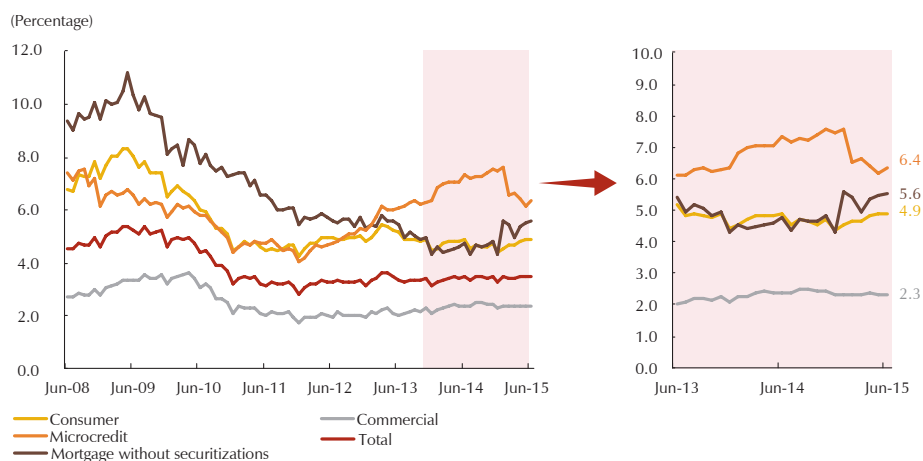
16 The decrease that is being shown by the microcredit default loan portfolio, primarily derived from *Fondo de Solidaridad Agropecuario* (Fonsa), Agricultural Solidarity Fund, whereby customers with loans aimed to the agricultural sector and which have defaults in their payment have the option to cancel their debts under favorable conditions.

Graph 7

A. Quality Risk Indicator



B. Default Risk Indicator



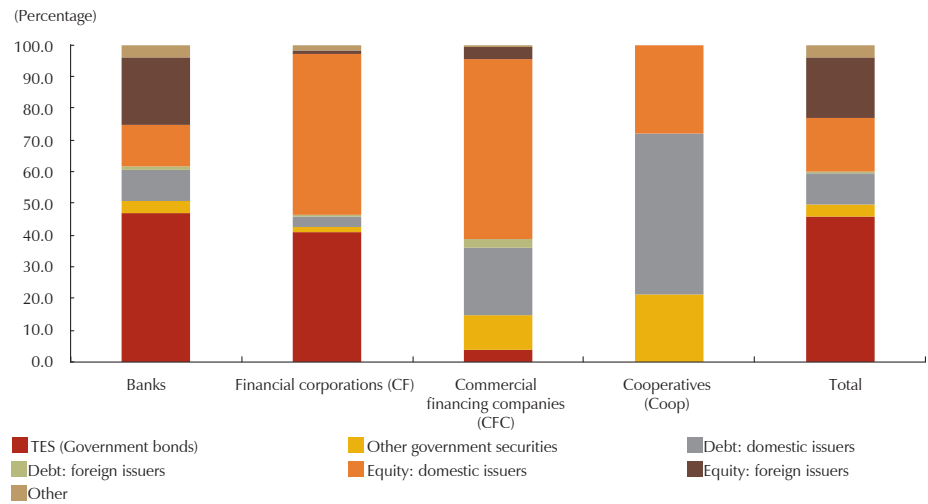
Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

On the other hand, credit institutions investments have accelerated in the last year, registering an annual real growth of 21.5% in June 2015, reaching \$ 101.8 trillion. The composition of these investments remained stable in recent months, and it is highlighted that the government bonds (TES), the equity instruments of foreign issuers and the equity instruments of domestic issuers<sup>17</sup>, are the investment vehicles with the largest share, accounting for 45.9% , 19.3% and 16.7% respectively (Graph 8).

When analyzing the liabilities of these entities, it is observed that as of June 2015 these were at \$ 439.6 trillion, registering an annual real growth of

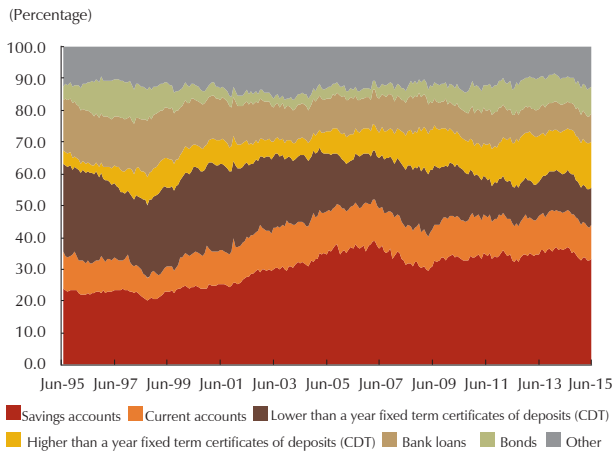
<sup>17</sup> Equity instruments mainly refer to shares and equity securities of investment funds. Investments in subsidiaries and branches, as well as investments in associates, are the most involved ones within the equity instruments of the credit institutions.

Graph 8  
Type of Investment of Proportion of Total Investment



Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

Graph 9  
Composition of Liabilities of Credit Institutions



Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

10.2%. In terms of composition, a smaller share of traditional funding sources is highlighted (savings accounts, current and term deposits (CDT) decreased their share between December 2014 and six months later, from 71.4% to 70.1% ), and a greater involvement of non-traditional sources of funding, mainly driven by an increase in bonds and other instruments, specifically money market instruments (Graph 9).

As for profitability, the indicator for return on equity (ROE) amounted to 14.42%, while the return on assets (ROA) one ended up at 2.08%; these have been stable over the past six months. Likewise, solvency indicators, both technical and basic, remained stable and as of June 2015 reached values of 15.8% and 10.7% it that order<sup>18</sup>.

On the side of non-banking financial institutions, as of June 2015, the slowdown in the real annual growth of total assets, both in the proprietary position as in the third-party one, stands out compared to December 2014 (Table 2). Proprietary position assets showed an annual real growth rate of 9.6%, reaching \$ 61.5 trillion, of which 83.0% are held by the insurance companies. On the other hand, managed assets totaled \$ 534.0 trillion, recording an annual real growth rate of 7.4%. Entities which have the greater

18 Regulatory limits for technical solvency and basic solvency, are 9.0% and 4.5% respectively

Table 2  
Non-Banking Financial Institutions Proprietary and Third-Party Assets

	Dec-14				Jun-15			
	Trillion Colombian pesos	Financial system assets percentage	GDP percentage <sup>a/</sup>	Annual real growth	Trillion Colombian pesos	Financial system assets percentage	GDP percentage <sup>a/</sup>	Annual real growth
Pension and severance fund managers companies	185.8	16.4	23.8	12.1	188.0	16.9	24.3	6.8
Proprietary position	4.0	0.4	0.5	11.8	4.4	0.4	0.6	16.0
Mandatory positions	160.7	14.1	20.6	13.2	161.0	14.5	20.8	7.2
Voluntary positions	13.3	1.2	1.7	2.1	13.1	1.2	1.7	0.5
Severances	7.9	0.7	1.0	9.7	9.5	0.9	1.2	6.7
Insurance companies <sup>b/</sup>	50.6	4.5	6.5	6.7	53.1	4.8	6.9	9.5
General insurance	15.1	1.3	1.9	6.3	17.3	1.6	2.2	20.2
Life insurance	33.3	2.9	4.3	7.2	33.8	3.0	4.4	5.4
Trust companies	331.8	29.2	42.5	12.7	340.5	30.6	44.0	7.9
Proprietary position	2.4	0.2	0.3	6.0	2.5	0.2	0.3	8.8
Managed funds	329.4	29.0	42.2	12.7	338.0	30.4	43.7	7.9
Stockbrokers	16.2	1.4	2.1	23.9	16.0	1.4	2.1	1.8
Proprietary position	3.7	0.3	0.5	43.4	3.6	0.3	0.5	-2.3
Managed funds	12.5	1.1	1.6	19.1	12.5	1.1	1.6	3.0
Non-banking financial institutions total <sup>c/</sup>	586.1	51.6	75.0	12.1	599.3	53.9	77.4	7.5
Financial system total <sup>d/</sup>	1,135.85	100.00	145.38	10.12	1,111.11	100.00	143.49	3.18

a/ December 2014 GDP

b/ Includes the assets of general and life insurance companies, capitalization companies, insurance cooperatives and voluntary pension funds managed by these entities.

c/ Includes the assets of investment management companies in proprietary and third-party positions, investment mutual funds, insurance and reinsurance brokers and stock brokerage firms of the Colombian Mercantile Exchange (*Bolsa Mercantil de Colombia*).

d/ It is composed of the assets of the non-banking financial institutions, credit institutions, infrastructure suppliers and special official institutions.

Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

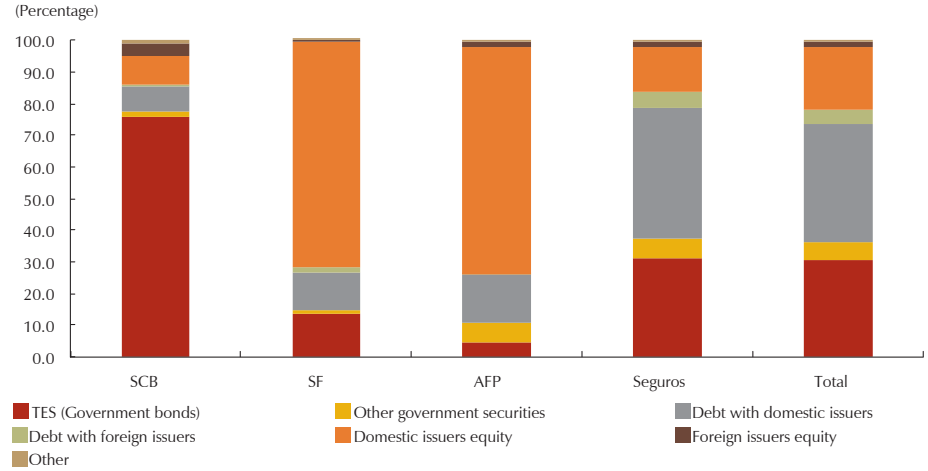
participation in the managed asset are trust companies (TC: 63.3%), followed by pension and severance fund managers (AFP in Spanish: 34.4%).

As for proprietary position investments of non-banking financial institutions, these were mainly concentrated in the local market of private debt (37.1%) and public debt (30.4%), and in equity instruments of domestic issuers (19.5%) (Graph 10, panel A). By type of business, the highest concentration in the domestic debt market was shown by stock brokerage firms (SBFs), while the largest market share of the domestic variable yield market was recorded in the pension and severance fund managers and trust companies.

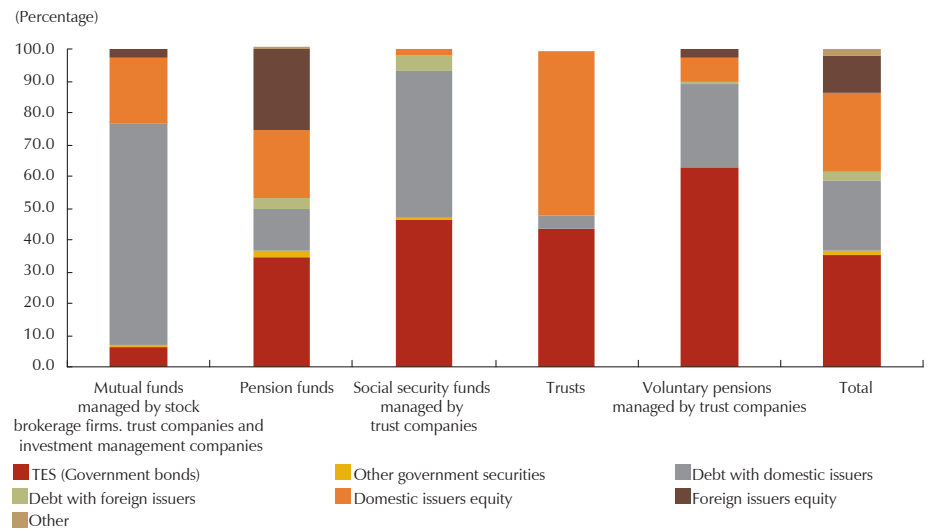


Graph 10  
Non-Banking Financial Institutions Investment Portfolio  
Composition

A. Proprietary Position



B. Managed Position



Source: Office of the Financial Superintendent of Colombia.

In the case of managed portfolios, investments concentrated in local government bonds (35.3%), equity instruments (24.9%) and private debt (22.4%) (Graph 10, panel B). In the case of mutual funds, a concentration in private debt securities of domestic issuers is highlighted. On their part, social security funds and voluntary pensions administered by trust companies were concentrated on domestic public and private debt, while the other trust businesses did, along with TES (government bonds), on equity instruments from domestic issuers.

Finally, regarding the financial health of the non-banking financial institutions in a proprietary position, the profitability indicators of the stock brokerage firms and trust companies remained at stable levels. The return on assets of

the stock brokerage firms was of 2.0%, while the trust companies one ended at 16.0%. Meanwhile, the return on assets of the pension and severance funds managers and insurance companies went from 15.0% and 2.2% in December 2014, to 13.9% and 1.6% respectively six months later.

## B. CREDIT RISK

### 1. Corporate sector

Given that as of June 2015 the loan portfolio of private enterprises totaled \$182.8 trillion, participating with 51.8%<sup>19</sup> of the total loan portfolio of credit institutions, it is important to evaluate the financial health of these debtors, and to track the performance of their loans in order to anticipate potential risks to the stability of the financial system. To this end, this section analyzes the indebtedness these agents have by funding instrument and type of currency. Likewise, the performance of the financial indicators of the sample of companies supervised by the Office of the Superintendent of Companies between 2008 and 2014 is featured. Additionally, a sectorial analysis in which credit risk indicators are calculated by economic activity sector is performed in order to identify the sectors which may experience difficulties to comply with the timely payment of their obligations in a less favorable economic environment. Finally, the vulnerability of the private corporate sector is analyzed in two ways: i) using the interest hedging indicator to identify fragile firms, and ii) determining what kind of debtors are affected by depreciations of the exchange rate.

#### *i. Private corporate sector indebtedness evolution*

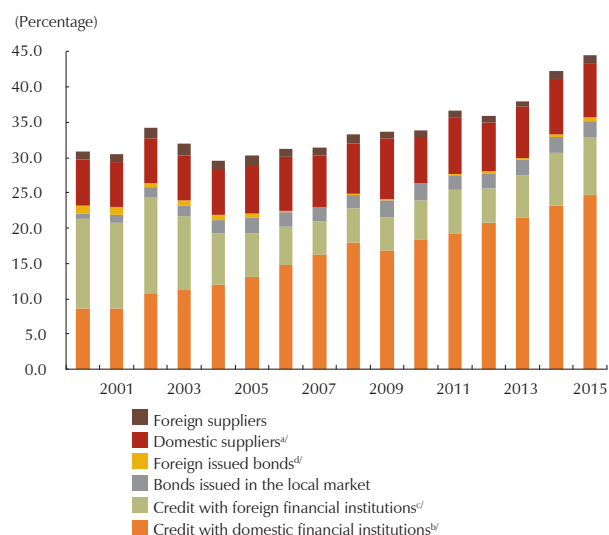
The analysis of the indebtedness of the private corporate sector is important, because it allows to identify not only possible situations of over-leveraging, but also the degree of dependence on a particular source of funding, which may jeopardize the fulfillment of the obligations of these agents with the financial system.

In June 2015 the total indebtedness of the private corporate sector as a share of the GDP was at 44.5% (\$ 344.5 trillion), showing a 2.2 percentage points increase compared to 2014. This increase was due to higher indebtedness balance with domestic and foreign financial institutions (Graph 11).

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<sup>19</sup> Private companies' loan portfolio includes the balance of microcredit and commercial loan portfolios placed on private companies, excluding loans granted to public companies and to those engaged in financial intermediation. For this reason, the sum of percentages of commercial loans and microcredit presented in the section Current situation of the financial system on Chapter II of this Report, is different from the percentage presented in this section.

**Graph 11**  
Financial Debt of the Private Corporate Sector as a share of GDP, by Instrument

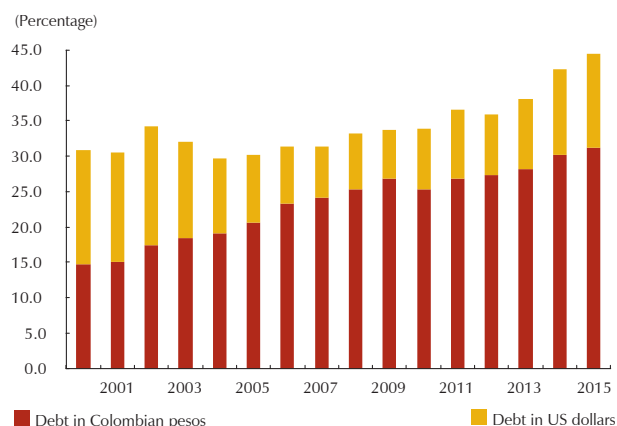


a/ Only includes information from companies that report financial statements to the *Superintendencia de Sociedades*. Due to data availability, as of June 2015, a suppliers' balance equal to the one reported in December 2014 is assumed.  
 b/ Includes commercial financial leasing operations. This item is composed of loans denominated in legal tender and foreign currency for the commercial and microcredit loan portfolios.  
 c/ Includes financial leasing operations.  
 d/ The balance of foreign issued bonds is underestimated since it does not include overseas issuances for subsidiary companies.  
 Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, *Banco de la República*; calculations by *Banco de la República*.

Between December 2000 and June 2015 the main sources of funding of the private corporate sector have been loans with domestic and foreign financial institutions and domestic suppliers, while the less used were bonds issued abroad and overseas suppliers. It is noteworthy that, after 2003, a substitution of credit with foreign entities by the one with domestic financial institutions is noted.

When analyzing indebtedness by type of currency, it is noticed that since 2004 private companies acquire most of their debt in Colombian pesos (70.0% of the debt total of June 2015, equivalent to 31.2% of the GDP). However, debt in dollars as a percentage of the GDP has experienced an increase of 3.6 percentage points since 2013, driven by a higher balance of debt with foreign entities, which has increased more because of the depreciation of the Colombian peso *vis-à-vis* the US dollar than due to a greater funding of firms (Graph 12). From these 3.6 percentage points of increase, about 3.4 pp were due to depreciation.

**Graph 12**  
Financial Debt of the Private Corporate Sector as a share of GDP, by Currency



Note: Made with the same data as Graph 11.  
 Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, *Banco de la República*; calculations by *Banco de la República*.

ii. *Financial situation of the private corporate sector in December 2014*<sup>20</sup>

By December 2014, the sample used by *Superintendencia of Corporations* consisted of 26,227 companies, which accounts for 43.2% of the outstanding balance of the commercial loan portfolio. For the period of 2008-2014, twelve financial indicators were calculated in order to measure different attributes of the firms, such as activity, profitability, leverage, liquidity and credit risk, among others. This allows having different measures to facilitate the evaluation of the strengths and weaknesses of the companies.

As of December 2014, the operating revenues of the private corporate sector grew at an annual real

20 In this subsection, the private corporate sector is defined as the set of companies supervised by *Superintendencia of Corporations* whose financial statements (balance sheet, income statement and cash flow) are available on the website of this entity annually and with a closing date by December 31st each year.

**Table 3**  
**Financial Indicators of the Private Corporate Sector - December 2014**

Financial indicators	Figure in 2014	Comparison with respect to:		
		2013	2012	Historical average <sup>a/</sup>
<b>A. Activity indicator (percentage)</b>				
Sales annual variation	5.9	1.9	3.7	3.8
<b>B. Profitability indicators (percentage)</b>				
Return on assets <sup>b/</sup>	4.1	3.9	3.9	4.2
Return on equity <sup>c/</sup>	9.4	8.6	9.0	9.8
<b>C. Indebtedness indicators</b>				
Debt to assets ratio <sup>d/</sup> (percentage)	48.6	46.8	48.0	49.2
Financial debt ratio <sup>e/</sup> (percentage)	14.4	13.7	14.0	13.8
Financial burden <sup>f/</sup> (number of times)	4.2	3.7	3.4	3.5
<b>D. Liquidity indicator</b>				
Current ratio <sup>g/</sup> (number of times)	1.7	1.7	1.7	1.6
Working capital annual real variation <sup>h/</sup> (percentage)	0.8	2.7	2.3	2.0
<b>E. Size indicator</b>				
Total assets annual variation (percentage)	5.5	4.9	4.7	5.1
<b>G. Intensity of the relationship with the financial system</b>				
Number of relationships with credit institutions <sup>i/</sup>	2.0	2.0	2.0	2.0
<b>H. Risk indicators (percentage)</b>				
Loan portfolio quality indicator <sup>j/</sup>	3.6	3.5	5.5	5.4
Default quality indicator <sup>k/</sup>	0.7	0.9	1.6	1.3

Note: For each year, atypical observations by financial indicator were removed (percentiles 1 and 99), and the median of the resulting sample was calculated. The annual growths of the indicators are calculated using balanced samples, namely: the 2014 data are calculated based on a sample of the same data size of 2013.

a/ Simple average of the annual indicators observed for the 2008-2014 period.

b/ Measured as the ratio between operating profit and total assets.

c/ Measured as the ratio between operating profit and total assets.

d/ Measured as the ratio between total liabilities and assets. Total liabilities consist of the following items: financial obligations, suppliers, accounts payable, taxes, levies and charges, labor obligations, provisions, deferred, "other liabilities" and bonds and commercial papers.

e/ Measured as the ratio between financial liabilities (short and long term) and total assets. This indicator is significantly lower than the total debt because most companies in the sample (the median is taken as a central trend measure and not the average) concentrate their liabilities in instruments other than funding with financial institutions. In assessing the average of these indicators as of December 2014, it is noted that the total debt is of 41.6% and the financial debt is of 15.6%.

f/ Measured as the ratio between operating profits and interest expense.

g/ Measured as the ratio between current assets (assets convertible into cash in a less than one year term) and current liabilities (term equal to or less than one year).

h/ Working capital annual real growth, this being equal to the difference between current assets and current liabilities.

i/ Total number of existing relationships that a firm has with the financial institutions. To construct this indicator, it is only considered if a firm is indebted to a credit institution; regardless of the total number of outstanding loans that the former has with the latter.

j/ The quality indicator for loan portfolio risk is measured as the ratio of between the risk loan portfolio and the gross loan portfolio; both the numerator and the denominator include leasing.

k/ The non-performing loans ratio is measured as the ratio between the loan portfolio with a more than thirty days default and the gross loan portfolio; both the numerator and the denominator include leasing.

Sources: *Superintendencia de Sociedades de Colombia* and Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

rate of 5.9% (Table 3, panel A), a higher value than the observed in 2013 and the historical average. On the other hand, profitability indicators, despite recording lower levels than historical ones, showed a better performance over the past year (the return on assets increased from 3.9% to 4.1%, and the return on equity, from 8.6% to 9.4% between December 2013 and a year later) (Table 3, panel B).

As for leverage, when comparing the situation in December 2014 with that observed in 2013 and the historical average, a mixed behavior is found. Although the total and the financial debt increased during the last year, which

shows that companies were more leveraged in 2014, the financial burden indicator increased, reaching 4.2 times, which implies that the companies are generating more profits to cover the interest payments. For these indicators, with the exception of financial debt, results show a favorable situation with respect to the historical average (Table 3, panel C).

On their part, in December 2014, liquidity indicators show a favorable behavior, although recording lower levels compared to a year ago (the current ratio went from 1.71 to 1.67 between 2013 and 2014). The current ratio indicator is greater than 1, and the annual real growth of the working capital was positive, showing that, on average, the companies analyzed can cover all of their short-term liabilities by using their most liquid assets, and that the latter have a higher growth rate than the short-term liabilities one (Table 3, panel D). It should be clarified that an indicator less than 1 suggests that the firm may default on its short-term obligations, as its liquid resources are insufficient.

The growth rate for total assets of the private corporate sector was 5.5%, registering increases relative to those observed in 2012 and 2013, and compared to its historical average. Meanwhile, the banking relationships average of the firms remained at 2.

Finally, credit risk indicators show that the financial performance of companies has resulted in a stable perception on the risk of firms by credit institutions during the last year (the loan portfolio quality indicator increased from 3.5% to 3.6% between 2013 and 2014), and a decrease in the delinquency rate (the non-performing loans ratio decreased from 0.9% to 0.7%). Similarly, both indicators remain at levels below the historical average.

### *iii. Sectorial analysis*

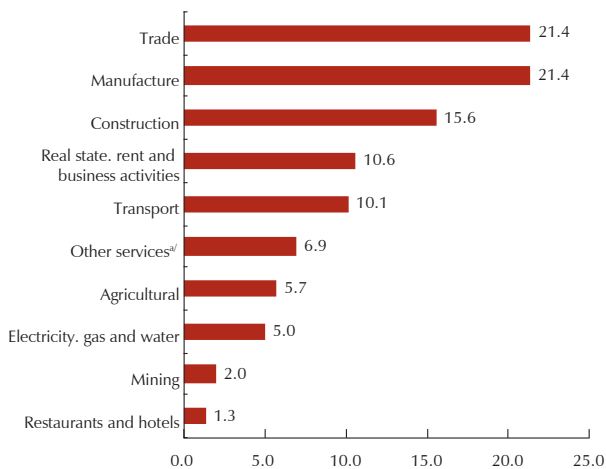
In a context of slowing economic activity, adverse weather conditions and a decline in commodity prices, it becomes necessary, in terms of financial stability, to analyze the performance of the commercial loan portfolio by economic sector, with the aim of identifying sectors that have been affected by this dynamic and, therefore, may have difficulties to meet their obligations on time.

As of June 2015, the economic sectors with the largest share in the loan portfolio granted to private companies were trade<sup>21</sup> (21.4% each) and construction (15.6%), while restaurants and hotels, mining, and electricity, gas, and water, are the least involved concentrating 8.3% of the loan portfolio (Graph 13).

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21 The trade sector also includes the repair of motor vehicles, motorcycles, personal belongings and household goods.

Graph 13  
Private Corporate Sector Loan Portfolio Balance  
Composition, by Economic Sector



Note: since the purpose of this section of the report is to analyze the private companies of the real sector, firms that are classified within the financial intermediation sector are not included.

a / In other services, firms belonging to the following economic sectors are grouped: public administration and defense, education, social and health services, other community, social and personal services activities, private households with domestic servants, and the organizations and extraterritorial organs one.

Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, and Banco de la República; calculations by Banco de la República.

During last year, the commercial liabilities credit risk indicators have exhibited a heterogeneous behavior. On the one hand, the non-performing quality risk indicator moved from 2.4% to 2.3% from June 2014 to June 2015, while the quality risk indicator increased 20 bp in the same period, registering 6.7% in June 2015. Thus, it can be inferred that perception as well as materialization of credit risk in this modality has not experimented significant changes. However, when calculating these same indicators per economic sector, it has been found that some have been exhibiting deterioration.

In Graph 14, panel A, it is observed that the agricultural, livestock, hunting, forestry and fishing sector (agriculture), the mining and quarrying sector (mining), and the transport, warehousing, and communications sector (transport) have experienced significant increases on their loan portfolio quality indicators between June 2014 and June 2015. The agricultural sector increased its indicator from

14.4%, to 17.5%, mining from 9.5% to 14.9%, and transport from 6.6% to 10.1%. For the remaining sectors, a relative stability or a decrease is noted. As for the non-performing loans ratio, all sectors showed deterioration, except for construction and other services, highlighting the variation of the agricultural activity (from 5.2% to 7.5%) (Graph 14, panel B).

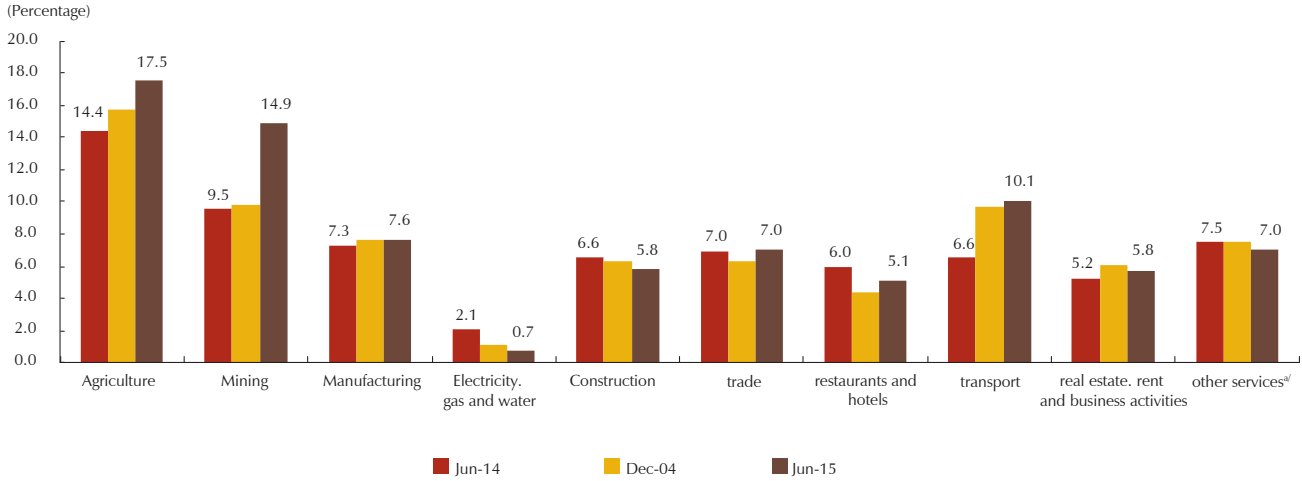
The above credit risk analysis identifies that the agricultural, mining and transport sectors show deterioration on their indicators between June 2014 and the same month of 2015. When analyzing these sectors in detail, evaluating the performance of their main sub-sectors, it can be seen that as for agriculture, the increase in the delinquency rate is mainly explained by the behavior of the agricultural production, livestock production and mixed-activity sub-sectors (Figure 15, panel a), whereas for mining, deterioration has been caused by the coal mining subsector (Graph 15, panel B); and for transport, the greater default in loan payments is due to the land transport and mail and telecommunications sub-sectors (Graph 15, panel C).

#### iv. Analysis of vulnerable companies

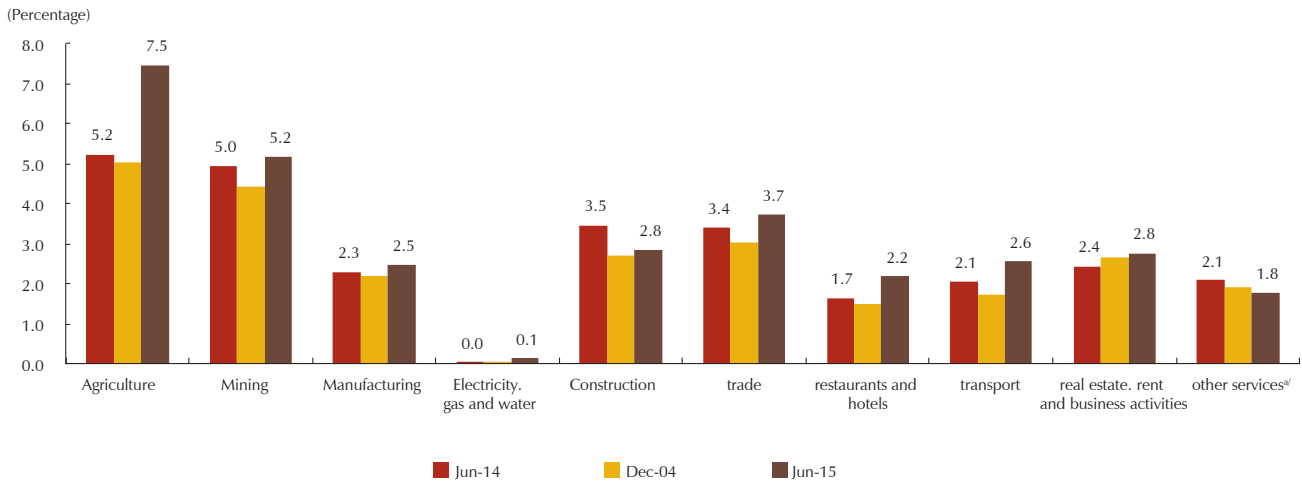
This section assesses the vulnerability of the private corporate sector by identifying fragile companies. The fragility of the firms was determined by two methodologies: i) the interest coverage ratio, and ii) by determining what types of debtors are affected by devaluations in the exchange rate.

Graph 14  
Credit Risk Indicators by Economic Sector

A. Loan Portfolio Quality Indicator by Economic Sector



B. Non-Performing Loan Indicator by Economic Sector



Note: since the purpose of this section of the report is to analyze the private companies of the real sector, firms that are classified in the financial intermediation sector are not included.  
 a / In other services, firms belonging to the following economic sectors are grouped: public administration and defense, education, social and health services, other community, social and personal services activities, private households with domestic servants, and the organizations and extraterritorial organs one.  
 Sources: Office of the Financial Superintendent of Colombia, Superintendencia de Sociedades and Banco de la República; calculations by Banco de la República.

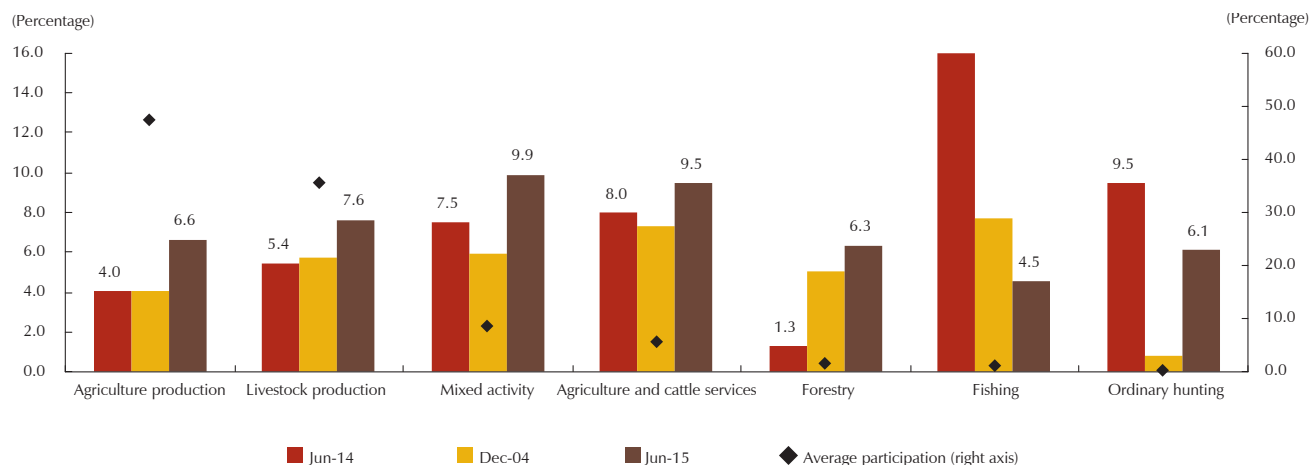
*Interest coverage ratio*

The IMF, on the April 2014 issue of the Global Financial Stability Report, proposes a methodology for identifying fragile firms by the interest coverage ratio (ICR) which is defined as the ratio between the EBITDA<sup>22</sup> and interest payments. A firm is considered fragile if its indicator is below two times, a situation which is interpreted as one in which the firm may have difficulty

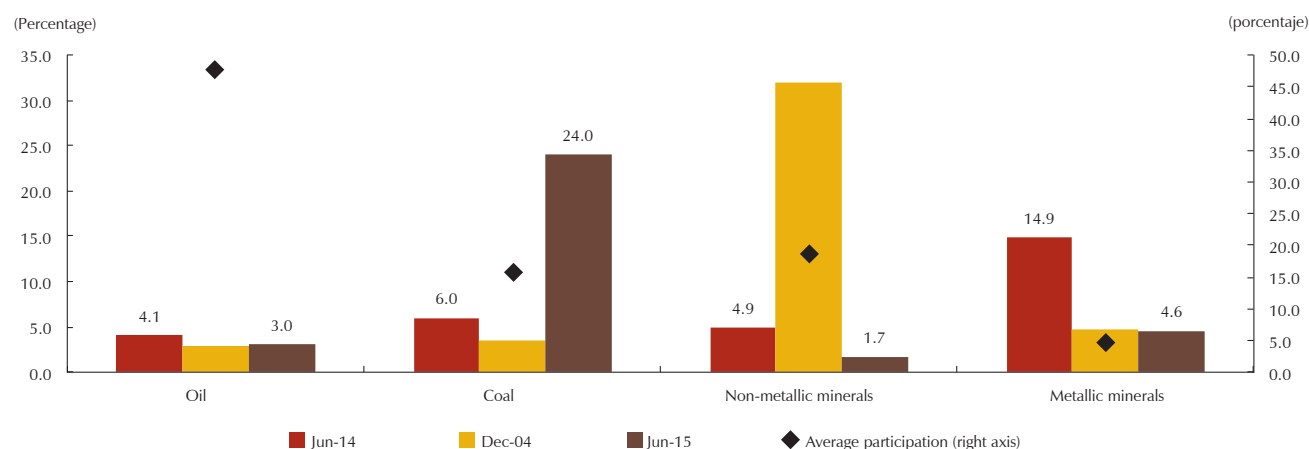
22 Financial indicator built with data from the income statement calculated as the sum of the operating profit and non-effective expenses flows (depreciations, amortizations and provisions).

Graph 15  
Non-Performing Loan Indicator by Economic Sub-Sector

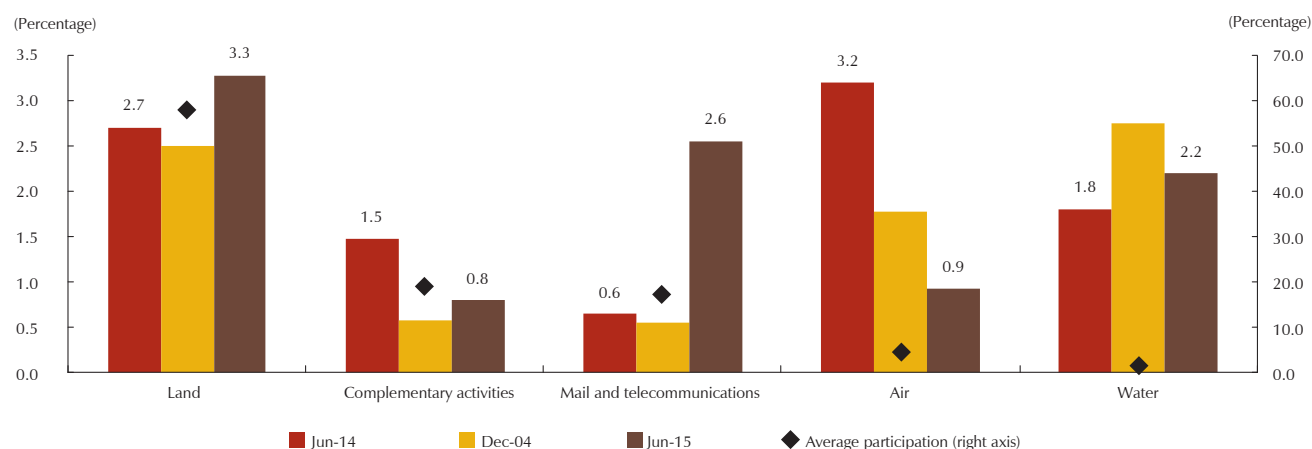
A. Agricultural Sector



B. Mining Sector



C. Transport Sector



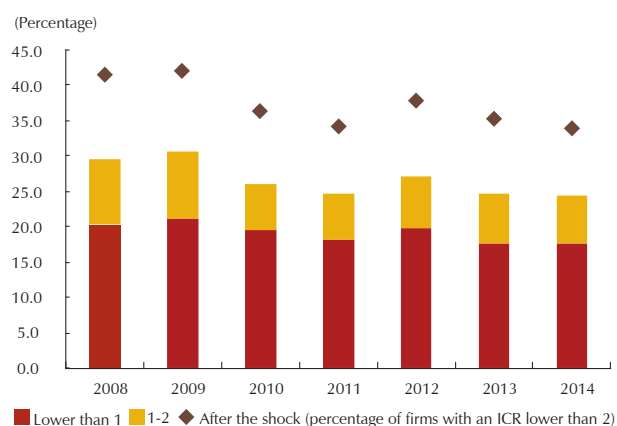
Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, and *Banco de la República*; calculations by *Banco de la República*.



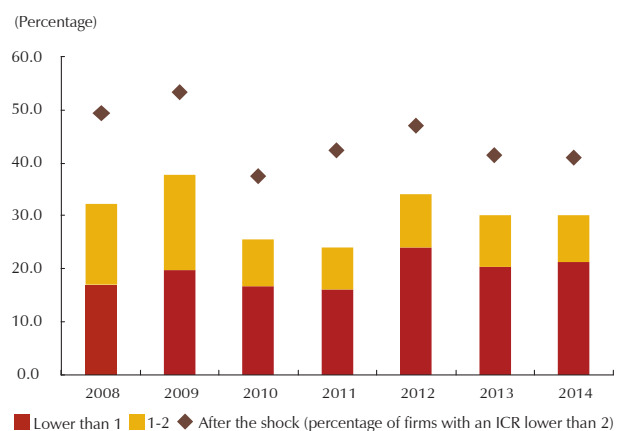
to meet interest payments on its obligations to third parties, since cash flow generates low liquidity. Additionally, an adverse situation is when the indicator is below 1, since the resources derived from its operation are insufficient to assume debt service.

Graph 16

A. Distribution of Fragile Firms by Interest Hedging Index (percentage of the total of firms of the database at *Supersociedades*)



B. Debt at Risk Distribution by Interest Hedging Index (percentage of the total of firms of the database at *Supersociedades*)



Source: *Superintendencia de Sociedades*; calculations by *Banco de la República*.

The exercise aims to build two performance indicators: firstly, to calculate the proportion of fragile firms and, secondly, debt risk<sup>23</sup>, i.e., the proportion of debt held by these firms. As an additional exercise, a shock to the ICR is applied by simultaneously decreasing the numerator and increasing the denominator of the ratio in a proportion of 25%. This sensitivity analysis simulates the potential effects that companies could face with the simultaneous occurrence of high debt levels, low payment capability, adverse external financing conditions and a reversal of capital flows, among others. The aggregate effects of this situation would derive in an increase in the funding costs and a fall on profits.

As of December 2014, 24.3% of the sample companies of Superintendencia of Corporations<sup>24</sup> were considered fragile firms (i.e., that have a lower than two times ICR), and the debt held by these companies was 30.1% of the debt total of the sample. In the stress scenario, the proportion of fragile firms would increase to 33.8%, and the debt at risk would represent 41.1% (Graph 16, panels A and B).

In terms of the representativeness of the debt with the financial system, the sample of companies of *Supersociedades* has concentrated on average 40.7% of the portfolio of commercial loans between December 2008 and June 2015<sup>25</sup>. Meanwhile, by

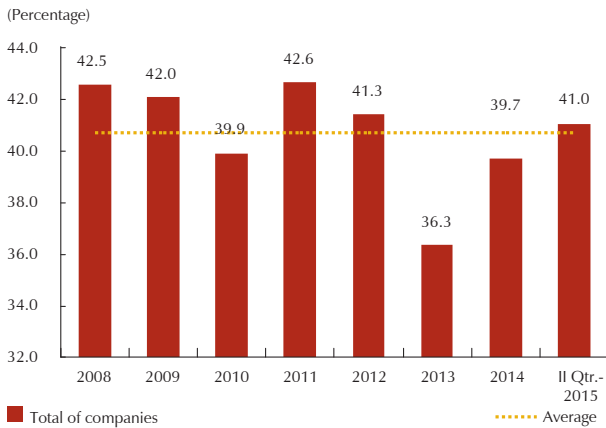
23 The total debt of a firm is calculated as the sum of financial obligations, accounts payable to suppliers and bonds (short and long term). This information corresponds to liability accounts of the balance sheet, reported by *Superintendencia of Corporations*.

24 The analysis of this subsection excludes the firms for which it is not possible to calculate the ICR due to data availability and those which are under equity loss. According to Article 457 of the Colombian Commerce Code, companies that are or will initiate a dissolution process are in this situation.

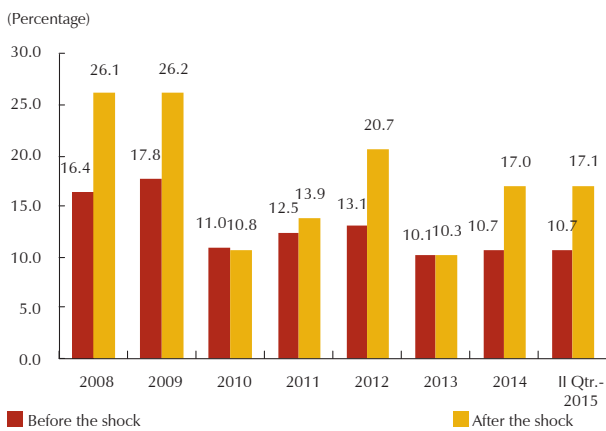
25 By June 2015, the group of fragile companies identified with balance sheet information as of December 2014 is taken.

Graph 17  
Commercial Loan Portfolio Concentration

A. Total of companies (*Supersociedades* sample)<sup>a/</sup>



B. Fragile Companies (lower than 2 ICR)



a/ Excludes firms that are under equity loss and those for which it is not possible to calculate the ICR due to data availability.  
Sources: *Superintendencia de Sociedades* and Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

June 2015, fragile firms, before and after the shock, account for 10.7 and 17.1% of the total commercial loans respectively (Graph 17). It should be clarified that this exposure may be underestimated, because it is not possible to calculate the ICR for all the companies that have commercial loans with the financial system<sup>26</sup>. Also, when assessing the loan portfolio of fragile firms as a percentage of the total loan portfolio of each economic sector in the sample by *Supersociedades* (Graph 18), it is observed that the agricultural and real estate sectors have the greater representativeness (36.2% and 39.1% respectively).

The credit risk indicators, the loan portfolio quality indicator and the non-performing loans ratio, show that the fragile companies have higher risk levels versus those observed for the total sample (Graph 19). This implies that the ICR is a good tool to identify vulnerable firms, which have risk indicators that are even the double those observed for the total sample.

Finally, by June 2015, the fragile firms belonging to the sectors that have shown the greatest deterioration in terms of credit risk over the past year have a higher loan portfolio quality indicator than the levels recorded by the total of fragile companies from the corporate sector. However, this is not reflected in the delinquency rate, as the non-performing loans ratio of fragile companies

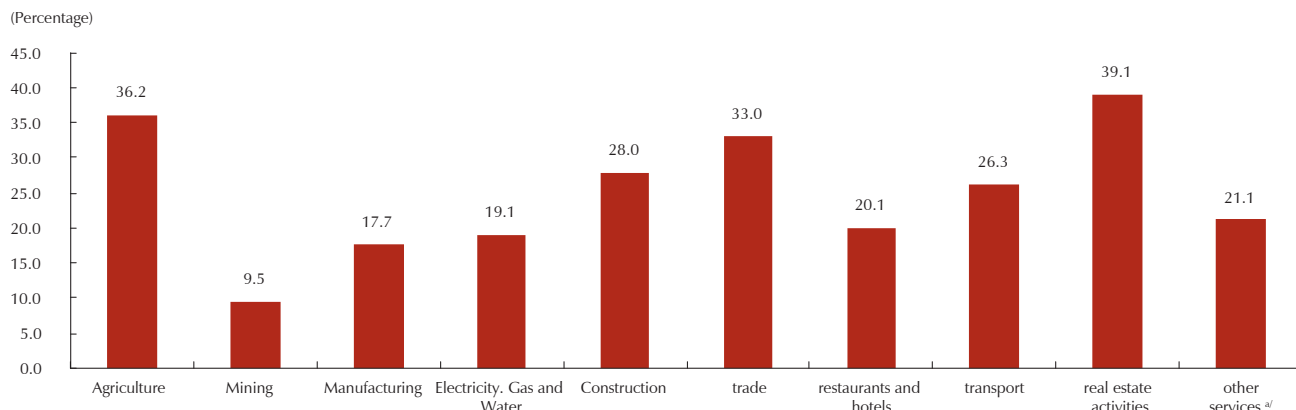
in the agricultural, mining and transport sectors is lower compared to the average of fragile companies (Graph 20).

*Debtors vulnerable to depreciations of the exchange rate*

By June 30, 2015, the accumulated depreciation of the exchange rate of the Colombian peso *vis-à-vis* the US dollar amounted to 38.1% compared to the rate registered on July 31, 2014, date from which a progressive increase had been taking place. This shows a situation of high depreciation that could

26 Not all companies with commercial loans are supervised by *Superintendencia de Sociedades*. Additionally, interest expenses report published by this Superintendency, does not contain all the companies reported in the financial statements. As an example, by December 2014, only 20,588 of the 26,227 companies in the sample have a register in the interest expenses report.

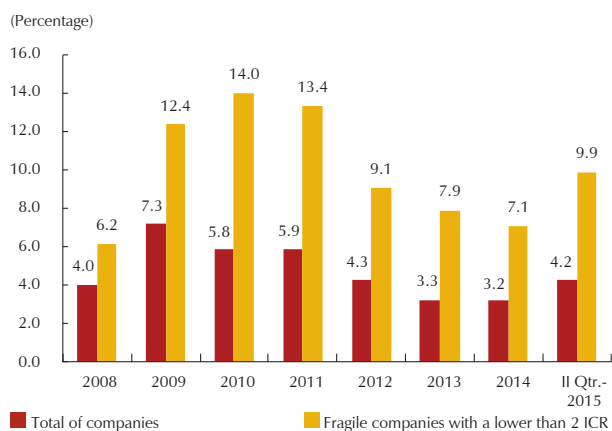
**Graph 18**  
**Loan Portfolio of Fragile Firms as a Share of the Loan Portfolio of each Economic Sector as of December 2014**



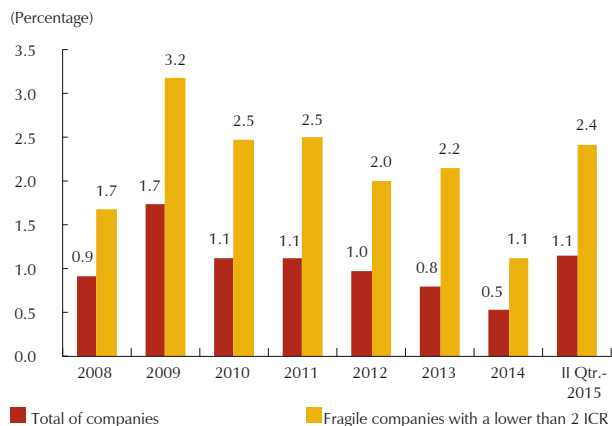
Note: since the purpose of this section of the report is to analyze the private companies of the real sector, firms that are classified in the financial intermediation sector are not included.  
a/ In other services, firms belonging to the following economic sectors are grouped: public administration and defense, education, social and health services, other community, social and personal services activities, private households with domestic servants, and the organizations and extraterritorial organs one.  
Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades* and *Banco de la República*; calculations by *Banco de la República*.

**Graph 19**  
**Credit Risk Indicators**

**A. Loan Portfolio Quality Indicator**



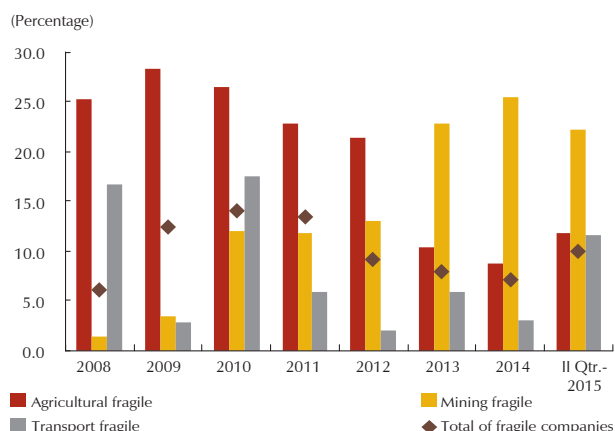
**B. Non-Performing Loan Indicator**



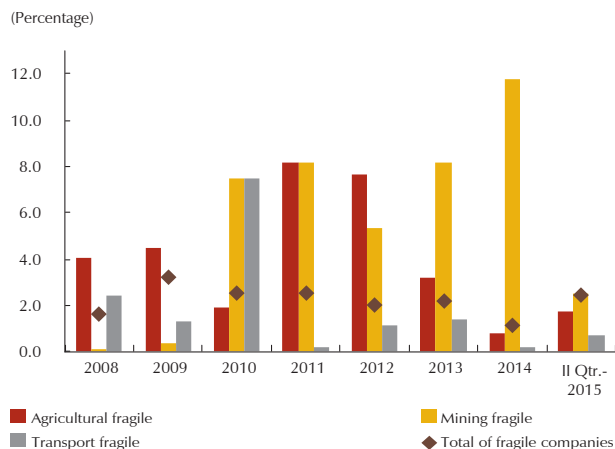
Sources: *Superintendencia de Sociedades* and Office of the Financial Superintendent of Colombia; *Banco de la República*; calculations by *Banco de la República*.

**Graph 20**  
**Credit Risk Indicator by Sectors: Fragile Companies**

**A. Loan Portfolio Quality Indicator**

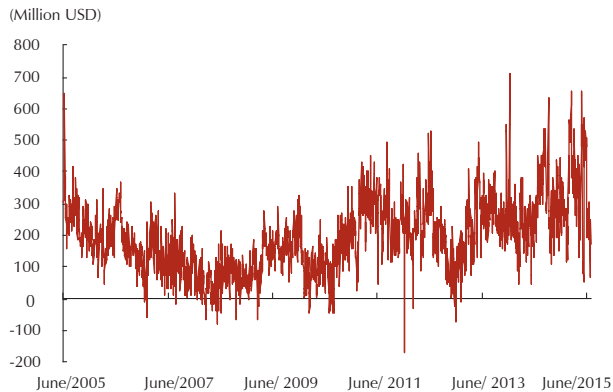


**B. Non-Performing Loan**



Sources: *Superintendencia de Sociedades* and Office of the Financial Superintendent of Colombia; *Banco de la República*; calculations by *Banco de la República*.

Graph 21  
Proprietary Position of Foreign Exchange-Market Intermediaries<sup>a/</sup>



a/ The proprietary position is defined as the difference between the rights and obligations of the proprietary position of the intermediaries of the foreign exchange market.  
Source: Office of the Financial Superintendent of Colombia; Banco de la República; calculations by Banco de la República.

have effects on the stability of the Colombian financial system.

Considering that there are limits to currency mismatches in the financial system<sup>27</sup> in Colombia, and that the foreign exchange market intermediaries usually decide not to take the exchange rate risk (Graph 21), it seems to be that the main risk channel of depreciation over financial stability is a situation of non-payment by the real sector. The objective of this subsection is to analyze the exposure of the financial system to companies which are vulnerable to depreciation of the exchange rate due to their business activity or level of debt in foreign currency (F/C).

In a scenario of depreciation, the highest value of liabilities in foreign currency and/or lower earnings for importers can lead companies to not fulfill their obligations to the financial system. Given these sources of risk, two groups of debtors that are potentially vulnerable to this situation were identified:

- 1) Net importer companies supervised by the *Superintendence of Corporations* with higher than 10% net imports to operating income ratio<sup>28</sup>.
- 2) Debtors of resources denominated in foreign currency (with the Colombian financial system and/or abroad), and which are not engaged in foreign trade.

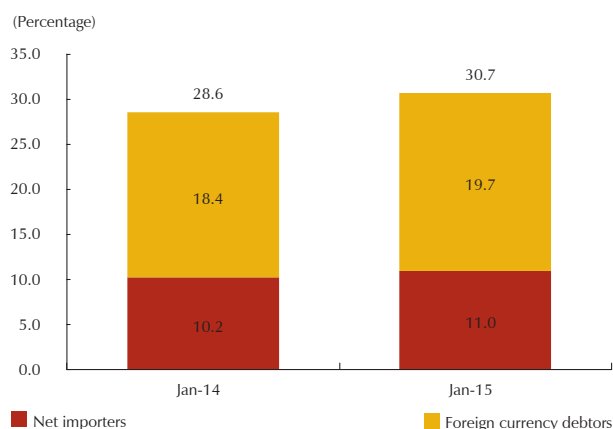
The first group consists of 2,844 firms, representing 0.7% of the total private debtors, which have a total debt to the financial system of \$19.9 trillion, representing 11.0% of the commercial loan portfolio balance granted to the private corporate sector by June 2015. On its part, the second group is composed of 15,997 companies (4.1% of the private borrowers of the total commercial loan portfolio) that have commercial credits worth 35.6 trillion (19.7% of the commercial loan portfolio granted to private agents at the end of the first semester of 2015). The exposure of the financial system to these two groups of firms, in terms of balance and debtors, has slightly increased

27 DODM 139 External Circular 139 of Banco de la República, External Resolution 9 of 2013 of the Board of Directors of Banco de la República, and Article 59 of External Resolution 8 of 2000 of the Board of Directors of Banco de la República.

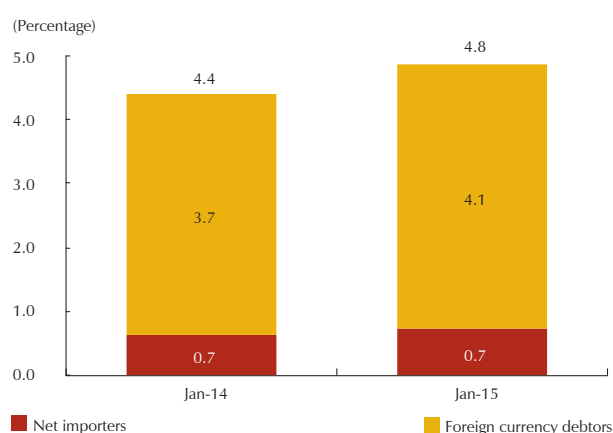
28 Due to data availability on the operating income account of the income statement, only those companies supervised by *Superintendence of Corporations* are considered.

**Graph 22**  
**Exposure of the Financial System to Vulnerable Companies facing a Depreciation**

**A. Exposure in Terms of Balance**



**B. Exposure in Terms of Debtors**



Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, National Directorate of Taxes and Customs (*Dirección de Impuestos y Aduanas Nacionales – DIAN*) and *Banco de la República*; calculations by *Banco de la República*.

compared to June 2014, from 28.6% to 30.7% in terms of balance, and from 4.4 % to 4.8% in terms of debtors (Graph 22).

As for credit risk, the two groups of debtors registered a lower loan portfolio quality index and non-performing loans ratio than those from the rest of the sample, except for the loan portfolio quality indicator in 2008 for foreign currency debtors, and in 2011 for net importers. Generally, net importers exhibit lower indicators to those from foreign currency debtors. Finally, it is noted that since 2013 the perception of risk that credit institutions have on the two vulnerable groups, has been influenced by the annual variation of the exchange rate, which is reflected in increases on the loan portfolio quality indicator when depreciation episodes occur between one period to the other, and reductions of it when the local currency appreciates with respect to the US dollar (Graph 23).

In order to estimate the possible effects of a larger depreciation, the mismatching (liabilities in foreign currency -assets in foreign currency)<sup>29</sup> was calculated for the two groups of companies as of December 2014 and June 2015. Then, it was assessed on how many of them would experience a larger than 30% and 50% decrease in the value of their equity of December 2014, if the Colombian peso were depreciated by 40% with respect to the rate recorded on 30 June 2015<sup>30,31</sup>. Table 4 features the results of this exercise. Facing a 40% devaluation, 428 firms

would experience a depreciation of their equity of more than 30% (269 net importers and 159 debtors in foreign currency). The debt of these firms is around 3.2% of the commercial credit granted to the private corporate sector.

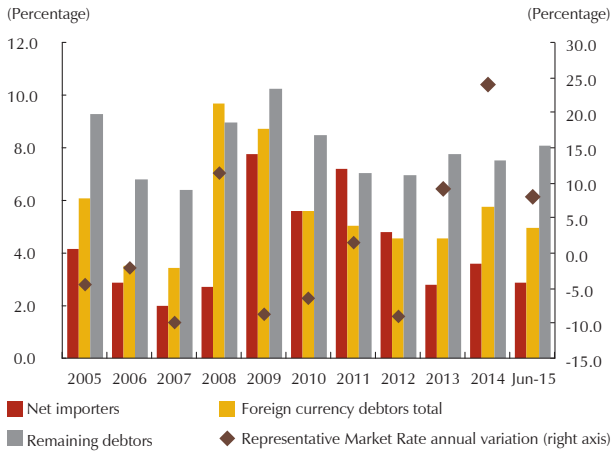
29 The calculation of the mismatch takes into account the direct investment of Colombian companies abroad.

30 The assumption of 40% is higher than the 20.8% depreciation observed between June 30 and September 30 of 2015.

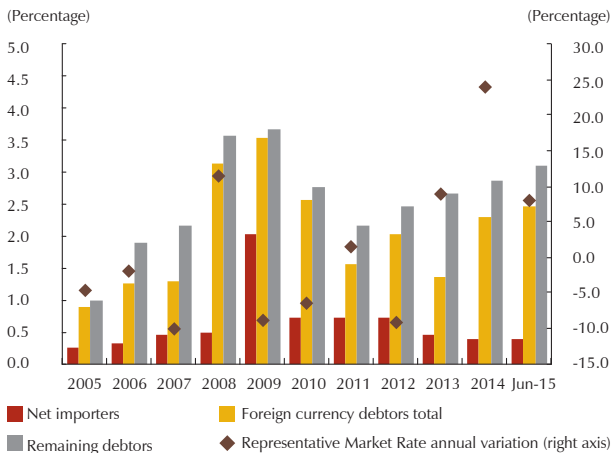
31 Of all potentially vulnerable importers, it is possible to calculate the depreciation of equity for 1,668 firms, which account for 92.3% of the loan portfolio, granted to this group; on the foreign currency debtors' side, the calculation for 672 companies can be made, which, together have 25.4% of the balance of credits placed for these type of borrowers. For the group of debtors in foreign currency, the percentage of companies on which this calculation can be made is low, because most of them do not have information for the mismatching as of December 2014, of the mismatching of June 2015, and the equity value for December 2014, data that is necessary to calculate the depreciation of equity.

Graph 23  
Credit Risk Indicators for the Analyzed Groups

A. Loan Portfolio Quality Indicator According to Vulnerable Groups



B. Non-Performing Loan Indicator According to Vulnerable Groups



Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, DIAN and Banco de la República; calculations by Banco de la República.

Table 4  
Vulnerable Firms due to Devaluation of their Equity facing a 40% Depreciation of the Colombian Peso and their Representativeness in the Commercial Loan Portfolio

Exposed group	Facing a 40% nominal depreciation vis-à-vis the U.S. dollar			
	Affected companies	Loan portfolio granted to the private corporate sector (percentage)	Affected Companies	Loan portfolio granted to the private corporate sector (percentage)
Net importers	187	1.02	269	2,35
Foreign currency debtors	117	0.59	159	0,86
Total	304	1.61	428	3,21

Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de Sociedades*, DIAN and Banco de la República; calculations by Banco de la República.

v. Conclusions

Since 2013, it is noted that indebtedness of the private corporate sector has significantly increased (from 38.0% of the GDP in December 2013, to 44.5% of the GDP in June 2015), mainly driven by an increase of the debt balance with domestic and foreign financial institutions. The dynamics of this last source of funding has been influenced by the depreciation experienced by the Colombian peso *vis-à-vis* the US dollar since mid-2014. After discounting the effect of the depreciation, it is observed that the change in the debt of the corporate sector as a percentage of the GDP is of 3.9 percentage points with respect to that observed in 2013, registering a 42.0% level as of June 2015.

The larger indebtedness of firms has been accompanied by financial indicators showing diverse results. On the one hand, improvements in sales growth and profitability compared to December 2013 are observed. Meanwhile, although it has exhibited deteriorations in the last year, the total debt indicator remains below historical levels, while liquidity indicators show a stable behavior. As for the credit risk indicators, stability in risk perception and a decrease in the delinquency rate are observed.

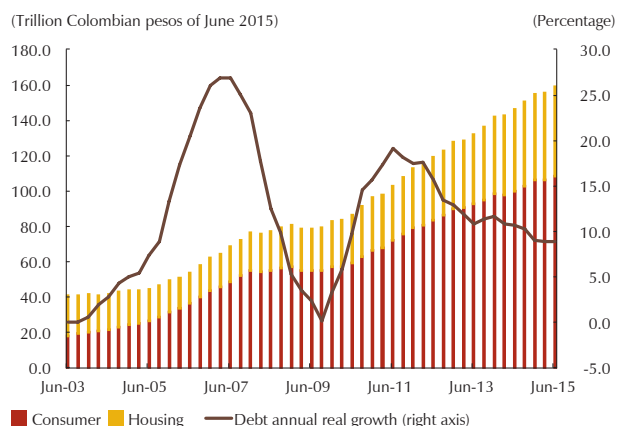
By economic sector, it is noted that firms engaged in agricultural, mining and transport activities are being affected by the current economic situation, which is reflected in higher levels of the non-

performing loans ratio and a greater perception of risk by credit institutions. It should be observed that the companies focused on these activities, account for 17.8% of the loan portfolio granted to the private corporate sector.

Finally, the identification of vulnerable companies allowed concluding, on the one hand, that as of December 2014, 24.3% of the firms supervised by Superintendencia of Companies were identified as fragile according to the ICR. Fragile firms, which to this date accounted for 10.7% of the commercial loan portfolio, have larger risk indicators than the total sample. Additionally, the fragile companies belonging to sectors that have shown greater deterioration (agriculture, mining and transport) show higher than average risk indicators than the fragile companies mean.

On the other hand, it was found that in June 2015, the financial system's exposure to potentially vulnerable debtors to depreciation scenarios slightly increased compared to June 2014; nonetheless, in a future context of further depreciation, vulnerable companies that will experience higher than 30% equity devaluations, only concentrate 3.2% of the loans total balance held by private companies.

Graph 24  
Household Debt Composition and Annual Real Growth



Note: to estimate the debt, not only is the information of the credit establishments included, but also that of the *Fondo Nacional del Ahorro* – FNA, credit unions and employee funds. For the CAC, the balance of the loan housing and consumer portfolio was forecasted for the months of July, August, and September 2013 due to information problems. As for employee funds, because of data availability, it was assumed that they grew at the same quarterly rate so far in every year and, for June 2015, an increase equal to the CAC's one. The housing loan portfolio includes the total balance of securitizations. Sources: Office of the Financial Superintendent of Colombia, *Superintendencia de la Economía Solidaria*, and *Titularizadora de Colombia*; calculations by Banco de la República.

## 2. Households

As of June 2015, household debt totaled \$159.0 trillion, of which 68.2% were consumer loans, and the remaining 31.8% belongs to mortgage<sup>32</sup> (Graph 24). The annual real growth of this joint debt remained relatively stable at 9.0%, after the declining trend observed since September 2011. By type of financial intermediary, credit institutions accounted for 87.3% of this loan portfolio, the solidarity sector (credit unions [CACs in Spanish] and employee funds) with 9.4%, and *Fondo Nacional del Ahorro* (FNA in Spanish) with 3.4%.

By type of credit, the home loan portfolio presented an annual real growth of 10.0% in June 2015, less than the one from six months ago. Similarly to this slowdown, home loan disbursements continued to decline, especially in the case of social housing (VIS in Spanish), which could be associated with

the completion of the housing subsidy program by the government. This

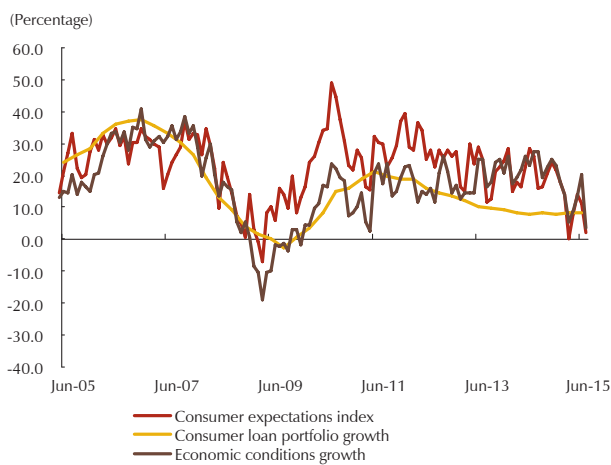
32 Household debt represented 20.0% of the GDP and 30.4% of the disposable income of these agents.



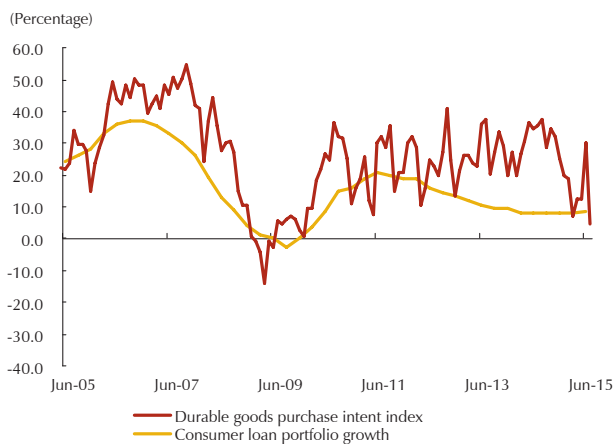
lower dynamics was accompanied by a deterioration in the non-performing loans ratio, which rose from 4.3% to 5.6% in the last six months. However, the loan portfolio quality indicator showed an improvement, from 4.2% to 3.8%, and the loan to value (LTV) remained stable (61.4% for social housing and 49.0% for non-social housing), which indicates that entities are less exposed if facing a fall in the house prices. Indeed, prices of this good continue to show positive real growth.

Graph 25  
Household Expectations Indexes

A. Expectations Index, and Consumer Economic Conditions and Real Annual Growth of Consumer Loan Portfolio



B. Durable Goods Purchase Intent Index and Real Annual Growth of the Consumer Loan Portfolio



Source: Fedesarrollo.

On its part, the consumer loan portfolio recorded an 8.5% annual real growth rate, remaining at levels similar to those observed since early 2014. The stability of this portfolio has been accompanied by a high volatility of the expectations and consumer economic conditions and durable goods purchase intent indexes, which decreased by July 2015 (Graph 25, panels A and B). Although disbursements of this type of credit show positive growth rates, these were lower than six months ago, emphasizing that the biggest slowdowns took place for car and drawing disbursements.

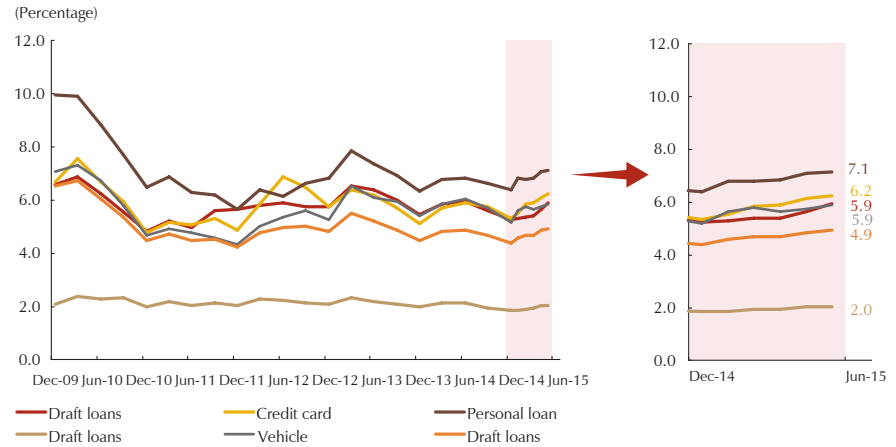
Risk indicators at the aggregate level of consumer loans, increased by about 50 basis points compared to six months ago, so the loan portfolio quality indicator was at 7.4% and the delinquency rate at 4.9%. The most severe deterioration in the non-performing loans ratio were exhibited in the modalities of credit card (86 bp), revolving loan (68 bp), drawing (64 bp) and car (63 bp) (Graph 26). Related to the above, the credit cards analysis by vintage shows that the loan portfolio quality indicator of the credits issued in June 2015 is higher than in the previous quarter and the last four-year average.

The financial burden of households, calculated based on balance sheet information from credit institutions and defined as the ratio between interest payments and amortization of capital over the disposable income of these agents, increased in 2015, reaching 9.5%<sup>33</sup> (Graph 27, panel A). By type of credit, the financial burden associated with consumer loans amounted to 7.7%, while that of housing loans was of 1.8% (Graph 27, panel B).

33 This level remains being below the maximum reached in 1998 (10.0%)



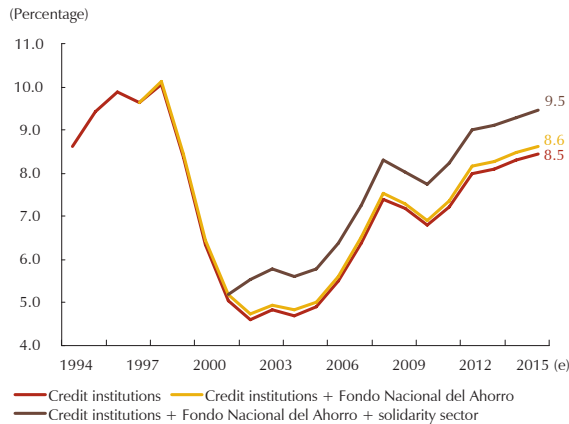
Graph 26  
Non-Performing Loan Indicator for the Main Categories of the Consumer Loan Portfolio



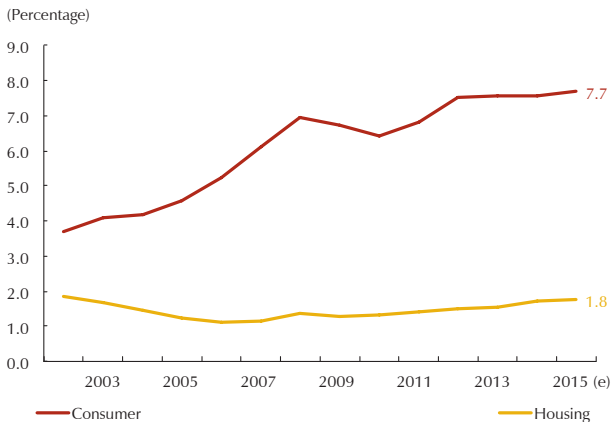
Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

Graph 27  
Households Financial Burden

A. By Sector



B. By Credit Modality



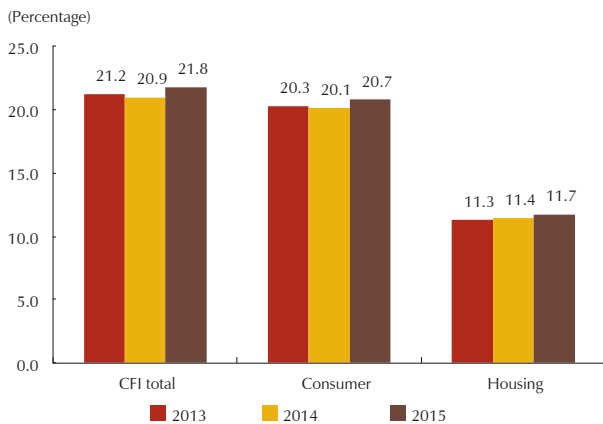
(e) estimated.  
Sources: Office of the Financial Superintendent of Colombia, Superintendencia de la Economía Solidaria and Titularizadora de Colombia; calculations by Banco de la República.

Similarly, the financial burden built with information from the credit bureau CIFIN, exhibited an increase in the last year, from 20.9% to 21.8%<sup>34</sup>. By type of credit, it is also noted that consumer is the most representative in terms of the financial obligations that this sector must address (Graph 28).

In general, it is noticed that for households the identified vulnerabilities are associated with consumer loan debtors, who concentrate most of the debt of these agents, as well as the largest financial burden. Specifically, credit card, revolving, personal investment and car loans are those sectors with the greater interest, given the evolution of their non-performing loans ratio. For this reason, in Chapter III of this Report, the results of a rolling exercise of the credit card and car loan portfolios are presented; the other two modalities are not analyzed due to lack of information.

34 *Asobancaria-CIFIN* has a database of the debtors of credit institutions, in which it registers the characteristics of all their obligations, including debt to the solidarity sector entities, the insurance and the real ones, as well as information related to the savings and current accounts of each debtor. Based on this information, it is possible to build a financial burden indicator for debtors who have an income estimate.

Graph 28  
Households Financial Burden (CFI) based on Information from CIFIN



Sources: Asobancaria (Colombian Banking Association) and CIFIN.

### C. MARKET RISK

Given the macroeconomic scenario discussed in Chapter I, it turns out to be consistent to identify a market risk in the securities held by financial institutions. The possible increase in the rates by the Federal Reserve of the United States (Fed), along with the risk of economic slowdown and rising inflation expectations in Colombia result in a possible depreciation in the value of securities, both for domestic fixed income and variable yield. With the above, and considering that public bonds (TES), private debt securities of domestic issuers and equity instruments (variable yield) of domestic issuers, are the three types of investments with the most representativeness within the

financial institutions' portfolio, the purpose of this section is to quantify the balance<sup>35</sup> subject to market risk of the investments in this type of assets and, thus, diagnose the exposure to the described risk. These balances will be subsequently used in the stress test exercise. It is noteworthy that the balance of the portfolios managed by the pension and severance funds managers is not reported. They are excluded from this analysis, since the measures presented are not the most appropriate for analyzing the vulnerability of these portfolios, considering that the fall in their value does not constitute the main risk for the contributor.

By August 2015, a decrease in the value of the exposed portfolio was reported, both in the proprietary position as in the third-party position of the financial system with respect to the recorded six months ago (Table 5). These falls are explained, largely, by the devaluation of securities during the analysis period.

On the side of credit institutions, between February and August 2015, a decrease in the balance of investments exposed to market risk, which is primarily associated with the behavior of commercial banks, was observed: their exposed value in TES decreased (in August 28, 2015, their exposed portfolio in TES reached 30.2 trillion, when it was at 33.1 trillion six months ago). Despite this decline, the participation of the TES in the analyzed investments was at 87.7%.

<sup>35</sup> According to information available at the Securities' Central Deposit (*Depósito Central de Valores -DCV*) of *Banco de la República*, and format 351 of *FSC*. The balances correspond to those exposed to market risk, according to the guidelines of the Basic Accounting and Financial Circular. For equity instruments of domestic issuers, the balance in shares was analyzed, while for debt securities those in trading and available for sale were analyzed.

Table 5  
TES Share (in Colombian pesos and Real Value Units), Financial Institutions Private Debt Securities and Shares Exposed to Market Risk

Total exposed balance	Feb-15				Aug-15			
	Percentage share			Balance (trillion Colombian pesos)	Percentage share			Balance (trillion Colombian pesos)
TES	Private debt	Shares	TES		RF Private Debt	Shares		
Credit institutions								
Commercial banks	89.16	10.84	-	37.12	87.70	12.30	-	34.46
Financial corporations	62.21	2.70	35.09	2.50	55.95	3.40	40.64	2.09
Commercial financing companies	20.13	44.58	35.29	0.06	35.59	35.76	28.65	0.07
Financial cooperatives	-	100.00	-	0.01	-	100.00	-	0.01
Non-banking financial institutions								
Proprietary position pension funds	41.28	58.64	0.08	0.63	22.73	74.32	2.95	0.59
Proprietary position stock brokerage firms	55.51	25.05	19.44	0.63	54.97	25.53	19.51	0.57
Third-party position stock brokerage firms	20.98	57.28	21.74	9.44	17.76	65.48	16.77	8.68
Proprietary position trust companies	75.63	7.32	17.04	2.48	68.36	6.46	25.18	2.56
Third-party position trust companies	45.30	30.89	23.81	144.90	45.71	29.56	24.73	138.95
Insurance and capitalization companies	34.95	39.25	25.81	16.60	36.72	37.30	25.98	15.89
Proprietary system	71.55	18.91	9.54	60.02	70.14	19.60	10.26	56.25
System	51.58	28.70	19.72	214.36	51.26	28.34	20.40	203.88

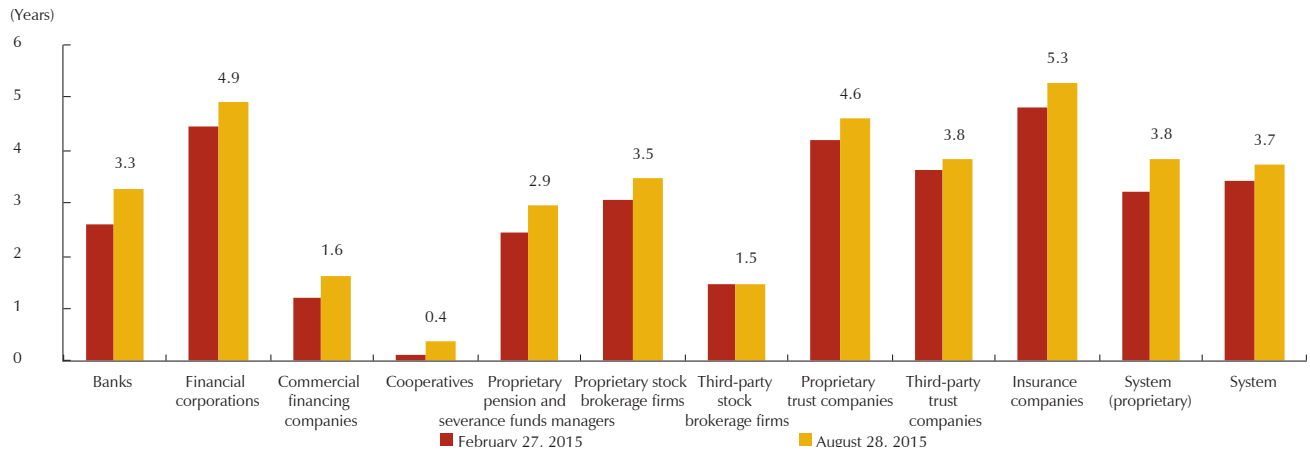
Note: The percentage share corresponds to the proportion of the balance (valued at market prices) exposed to risk, that is invested in TES, private debt or shares.  
Sources: *Depósito Central de Valores (DCV)*, Form 351 of Office of the Financial Superintendent of Colombia, and *Infovalmer*; calculations by *Banco de la República*.

As for non-banking financial institutions, a decrease in the exposed balance was also observed, which is mainly related to the reduction in the balance of the portfolio managed by trust companies. This behavior is due, to a large extent, to a reduction in the managed private and public debt securities. Despite the latter, the share by type of investment for these securities remained stable.

## 1. Duration

Also, for each of the entities in the financial system, the duration of their fixed income portfolio was calculated, including public and private debt. This indicator measures the price sensitivity of a bond to changes in interest rates and, at the same time, represents their effective maturity; that is, the time in which the holder of a bond recovers the investment. Between February and August 2015, an increase in the duration of the fixed income proprietary

Graph 29  
Duration of the Debt Portfolio



Sources: Depósito Central de Valores (DCV), Form 351 of Office of the Financial Superintendent of Colombia, and Infovalmer; calculations by Banco de la República.

and third-party position portfolio of the financial system took place (Graph 29), which is explained by an increase in the duration of the TES portfolio. By type of institution, the highest increases in the proprietary position were observed in the portfolios of banks, pension and severance funds managers and the insurance sector. On the side of the third-party position, the trust companies' portfolio registered the largest increase.

In short, the financial system recorded a decline in the value of market risk exposed portfolio, which was driven by the behavior of the portfolios of commercial banks and the one managed by trust companies, which had reductions in TES exposed portfolios. This decrease is largely due to the devaluation that securities have had during the analysis period. As for the duration, an increase in the portfolio in the fixed income proprietary and third-party position of the financial system was presented.

Graph 30  
Credit Institutions Deposits-to-Loan Portfolio Ratio



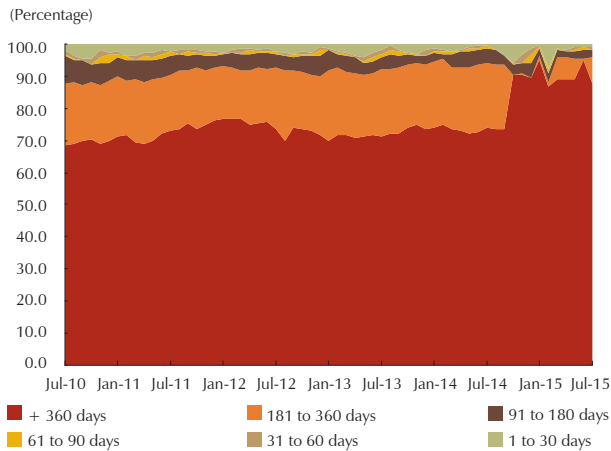
Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

## D. LIQUIDITY RISK

Between February and June 2015, funding through traditional sources, measured as the ratio of deposits over the loan portfolio, has shown a downward trend due to lower dynamics of deposits, compared to the loan portfolio (Graph 30) specifically, of current account deposits, which fell 8.1% in real terms during the first half of 2015.

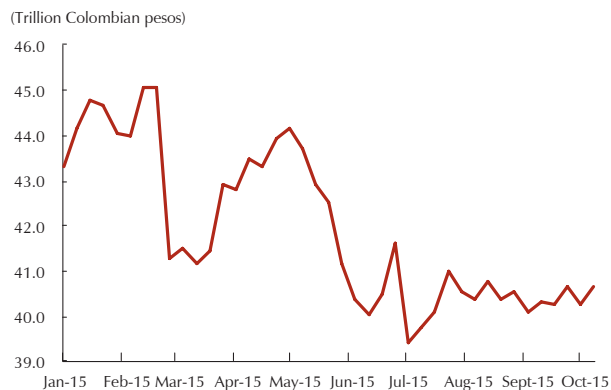
On their part, non-traditional funding sources have shown growth during the analyzed period. Specifically, the items of bonds and money market operations, which increased 3.8% and 50.3% in

**Graph 31**  
**Composition of Bonds Issued by Credit Institutions:**  
**Outstanding Balance at Maturity**



Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

**Graph 32**  
**Nominal Balance of Credit Institutions Investments in Public Debt Securities**



Note: the balance considers securities coming from simultaneous operations.  
 Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

real terms during the semester, are highlighted. In the case of bonds issued by credit institutions, although considered a non-traditional source of funding, these have shown relative stability, since in recent years the average term of issuances has been of more than five years and the outstanding balance has increased (Graph 31)<sup>36</sup>. This implies a reduction in the refinancing needs of these entities through such instruments.

Money market operations are another non-traditional funding source showing an important dynamism, specifically repurchase agreements (repos) with *Banco de la República*. The growth of these operations is related to the higher deposits that the General Directorate of Public Credit and National Treasury (*Dirección General de Crédito Público y Tesoro Nacional* - DGCPNTN in Spanish) has maintained in recent months at the central bank<sup>37</sup>, which has led to an increase on quotas at the expansion auctions (see Box 4).

Finally, another source of funds for credit institutions has been the sale of their investments in government bonds. In fact, their nominal balance decreased during the first half of 2015, indicating that these resources could have been used to finance loan portfolio growth (Graph 32).

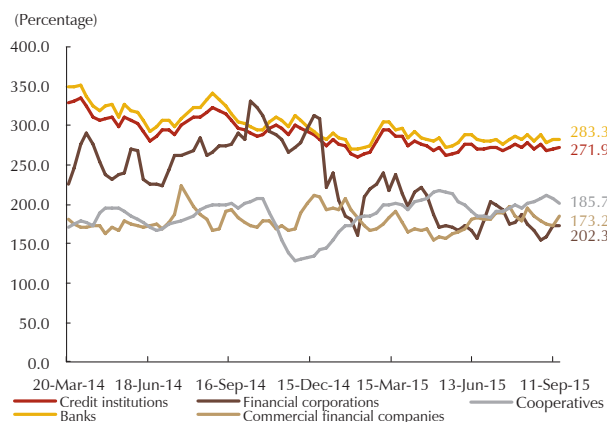
It should be noted that the liquidation of investments in government bonds has not had a significant effect on the liquidity risk indicator of credit institutions, which has remained at comfortable levels compared to the regulatory

minimum (Graph 33). This occurred because the cash during the semester increased in an amount similar to the reduction of investments. Thus, it is not perceived that these entities currently have difficulties to meet their short-term obligations with their liquid assets and, therefore, they are not having a high exposure to funding liquidity risk.

36 The increase in the days to the average maturity of the outstanding balance of the bonds issued by credit institutions, is evident in the participation of the more than one-year due securities, which rose from 73.3% on average between January and June 2014, to 86.9% in the same period of 2015.

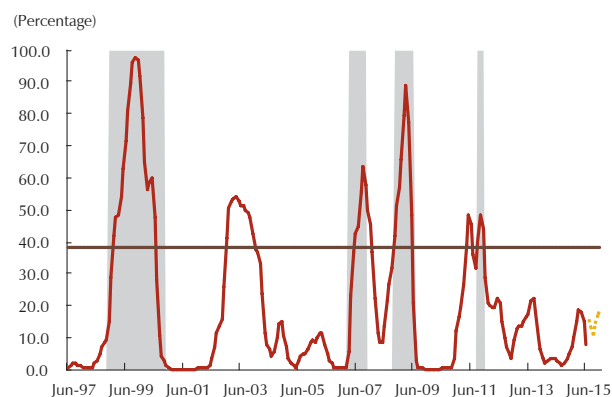
37 This increase was due to a higher than projected tax collection and the accumulation of deposits for the payment of TES maturing in the coming months.

Graph 33  
Liquidity Risk Indicator



Note: The featured liquidity risk indicator is a weighted moving average.  
Source: Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

Graph 34  
Financial Fragility Indicator



Source: Banco de la República.

Besides the individual indicators related to funding, there is another one that measures the vulnerability of the entire financial system, and that is specifically based on the analysis of traditional and non-traditional sources of funding of intermediaries. This measure is the financial fragility indicator<sup>38</sup>, which uses a wide range of variables related to credit risk, liquidity risk, profitability and solvency, and seeks to extract relevant information that accounts for potential weaknesses facing a cycle reversal.

The main results of this indicator are featured in Graph 34, where the red line represents the monthly estimate of the probability of being in a situation of financial fragility, the dotted yellow line indicates the forecast of this probability in six months horizon, and the gray areas correspond to the identified fragility periods; the horizontal brown line represents the threshold at which the alert episodes are defined. As it can be seen, the model shows a good adjustment to the fragility periods identified from the behavior of risk variables.

The behavior of this indicator in the second quarter of 2015 shows a downward trend, while the six-month forecast shows an increase not exceeding the alert threshold. This situation is explained by the increase in the use of non-traditional sources

of funding by credit institutions, which was accompanied by a slowdown in economic activity. Thus, although the indicator has increased due to possible vulnerabilities in terms of liquidity as a result of the variation in the funding structure, a more detailed analysis shows that there are some elements that allow inferring that this weakness may be insignificant.

As a conclusion, the wider use of non-traditional sources of funding does not seem to have increased the vulnerability of the system, because although the loan portfolio has grown at a faster pace than deposits, bonds remain having a high maturity. Also, the increase in money market operations, associated with the expansion of quotas by Banco de la República, and the liquidation

38 I. Lozano, and A. Guarín, (2014). "Banking Fragility in Colombia: An Empirical Analysis Based on Balance Sheets", *Ensayos sobre Política Económica*, vol. 32, núm. 75, 48-63.

of the investments, which has financed the growth of the loan portfolio, has not increased liquidity risk exposure.

Despite the above, there are other factors that could increase liquidity risk. First, credit intermediaries show a significant concentration of their deposits in institutional investors. Specifically, the concentration in mutual funds is relevant, because these funds are susceptible to massive withdrawals of deposits in the presence of high volatility in the markets. Although in overall demand deposits (savings and current accounts) of mutual funds only represent 6.4% of the total of the system, there are entities in which a significantly greater participation is observed at the individual level. In fact, as of June 2015, three entities showed an average share of 22.4% of mutual funds deposits. In turn, the assets of these entities accounted for 16.3% of the credit institutions total.

Second, the materialization of the credit and market risks mentioned in the previous sub-sections could have negative effects on the liquidity risk. In the first case, a deterioration in credit quality would imply a lower loan portfolio collection, which would result in lower cash flow. In the case of market risk, a devaluation of the investments would lead to entities having fewer liquid assets to cover their short-term operations.

Given these potential vulnerabilities, chapter III will assess the system's capacity to face a massive withdrawal of deposits from mutual funds, a lower cash flow as a result of credit deterioration, and a lower value of their investments.



## Box 1

### IDENTIFICATION OF SIGNIFICANTLY IMPORTANT CONGLOMERATES IN COLOMBIA

Wilmar Cabrera  
Daisy Johana Pacheco  
Ana María Yaruro\*

#### 1. Introduction

Following the international financial crisis, the Basel Committee on Banking Supervision (BCBS) has highlighted the need to identify systemically important institutions, financial groups, or financial conglomerates by their effects on the stability of local economies and the global economy. The identification of systemically important entities at a global (global systemically important banks: GSIB) and domestic level (domestic systemically important banks: DSIB), is a topic that has been on the agenda of the BCBS<sup>1</sup> and of several economies, including the European Union, Canada, Australia, Singapore, Chile, and Colombia. Most of these works follow the guidelines of the BCBS, in which five systemically important sources are considered (size, interconnectivity, substitutability, complexity and jurisdictional activity), which are weighted to generate a single indicator. The difference between each approach lies on the indicators that each nation uses to quantify these sources of systemic importance, due to the availability of information and the financial context of each jurisdiction (Table B1.1). Specifically, the jurisdictional activity dimension is used only to identify the GSIB, while the others are common among the works of the DSIB.

As shown in Table B1.1, the total assets variable is usually taken to measure the size, except by the Central Bank of Canada in 2013, where the definition of total exposure of the BCBS was applied. In the case of interconnection, the indicators are less homogeneous, emphasizing that Canada and the European Union add the obligations of issued debt securities, while Singapore adds a network analysis. The complexity and substitutability dimensions have greater variation among countries, although similar indicators are found, as the derivatives (in the first case) and negotiations performed in payment systems (in the second).

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\* The authors are part of the Financial Stability Department at *Banco de la República*. The views expressed do not reflect those of the Central Bank or its Board of Directors. Any errors or omissions are the sole responsibility of the authors.

1 Basel Committee on Banking Supervision (2011 and 2012).

As for financial conglomerates, there are few studies that identify systemically important groups, highlighting the document by Zambrano and Gonzales (2013) for Chile. This methodology includes qualitative and quantitative criteria to identify the major conglomerates. Within the first dimension, the legal definition of conglomerate is taken into account, as well as the presence in two or more financial sectors and a bank. Within the second, it includes an approximation of the exposed financial amount and the exposure of investors to the issuances of such groups.

This box shows the results of the identification of systemically important conglomerates in Colombia based on the guidelines of the BCBS. The document is divided into five sections, including this introduction. The second presents the current situation of conglomerates in Colombia; in the third, the data and the methodology adopted to identify systemic conglomerates is presented. In the fourth, results are shown and, finally, some conclusions and comments are highlighted.

#### 2. Current situation

In December 2014, 21 financial conglomerates were identified in Colombia, which reported a level of assets of COP \$946 trillion, representing 125.1% of the GDP and 86.1% of the Colombian financial system total level of assets. Compared with 2013, when 22 conglomerates were identified, these assets grew at a 7.8% annual real rate, lower than the one evidenced by the local financial system (10.1%). The identification of these conglomerates was based on the availability of public information consolidated in each group, and that reported according to the guidelines of Annex 2 of the External Regulatory Circular 139 of the Department of Operations and Market Development.

Table B1.2 features the composition of the financial conglomerates in Colombia following the definition of the work by Zambrano & Gonzales (2013), who define them as any group of related companies that have at least one bank and a presence in more than two financial sectors.

As may be seen in Table B1.2, from the entities of the financial system, trust companies and banks are those that have a greater presence in the formation of Colombian financial conglomerates. On their part, entities from the external and real sectors have a high presence in a small number of conglomerates. It can be seen that the first



Table B1.1  
Indicators for the Identification of Entities of a Systemic Importance

	BCSB	Australia	DSIF Singapore	Colombia	GSIF European Union	Canada
Size	Total exposure defined by Basel III <sup>a/</sup>	Total local assets	Proportion of bank assets	Assets	total Assets	Total exposure defined by Basel III <sup>a/</sup>
			Proportion of non-bank total deposits	Sources de alta exigibilidad		
			High demand Sources			
			Proportion of local non-bank deposits			
Substitutability	Assets in third party position	Assets in third party position	Participation in the electronic payments system	Number of counterparties in the payment systems	Domestic payment transactions value	Assets in third party position
	Activity of the payments system	Volume and amounts of the activity in the payments system	Proportion of assets in third party position	Payments liquidated and cleared through payment systems	Private sector deposits coming from depositors in the European Union	Activity in the payments system
	Operations underwritten in the debt and capital markets	Operations underwritten in the debt and capital markets	Proportion of the value of the operations underwritten in the debt and capital markets		Credits to the private sector to borrowers in the European Union	Operations underwritten in the debt and capital markets
		Total gross loans and advances	Banks that perform payments of checks denominated in dollars			
Complexity	OTC derivatives nominal value	OTC derivatives nominal value	Proportion of the OTC derivatives	OTC derivatives	OTC derivatives nominal value	OTC derivatives nominal value
	Level 3 assets	Negotiable and available for sale securities	Factors that affect the legal and operating structure (number of jurisdictions, number of business units)	Value of negotiable and available for sale investments		Level 3 assets
	Negotiable and available for sale securities	Risk level weighted assets for market risk				Negotiable and available for sale securities
Interconnection	Interbank assets	Interbank assets	Network analysis (based on in and out of the balance sheet exposure)	Asset positions in money market operations	Interbank assets	Interbank assets
	Interbank liabilities	Interbank liabilities	Proportion of interbank assets	Liability positions in money market operations	Interbank liabilities	Interbank liabilities
	Wholesale financing coefficient		Proportion of interbank liabilities		Issued debt securities obligations	Issued debt securities obligations

Table B1.1 (continued)  
Indicators for the Identification of Entities of a Systemic Importance

	BCSB	DSIF			GSIF	
		Australia	Singapore	Colombia	European Union	Canada
Inter-jurisdictional activity	Inter-jurisdictional assets				Inter-jurisdictional assets	Inter-jurisdictional assets
	Inter-jurisdictional liabilities				Inter-jurisdictional liabilities	Inter-jurisdictional liabilities

a/ This exposure is measured using paragraphs 157 to 164 of Basel III: A global regulatory framework for more resilient banks and banking systems (2010). Sources: Basel Committee on Banking Supervision (2011), Australian Prudential Regulation Authority (2013), Monetary Authority of Singapore (2014), European Banking Authority (2014), Bank of Canada, Box 5, Financial Stability Report (2013), authors calculations.

three conglomerates identified account for 65.0% of all entities, being the real and external sectors the most representative ones in this figure.

It is noteworthy that conglomerates with the highest number of subsidiaries abroad could become more complex and face a higher operational risk, given the great diversity of jurisdictions in which they operate.

### 3. Methodology

The guidelines of the BCBS for identifying systemically important entities consider a set of dimensions that reflect the potential sources of vulnerability of the financial system with these groups. As discussed, the variables considered depend on the availability of information and the current situation of the analyzed financial system. Table B1.3 shows the variables that are used to identify systemically important conglomerates in Colombia, and the criteria used for their aggregation.

In the category for size, proprietary position assets information of the financial groups consulted in the consolidated public balance sheets of each entity was used. Regarding data availability, third-party position assets are built adding information from third parties from entities of the local financial system belonging to each conglomerate.

As for the category on interconnection, the variables used correspond to the proprietary position of each group and are taken from the consolidated information of each entity. Finally, for complexity, the variables that are contemplated are gross derivatives and negotiable and available for sale investments, corresponding to the proprietary position of each group. Additionally, the number of entities abroad on which their balance sheets are consolidated are included within this category.

The weighting between the dimensions of size, interconnection, and complexity is 33.3% in each case; depending on the number of variables within each dimension, it is defined that each one has the same weight. Finally, it should be mentioned that dimension of substitutability is not included due to lack of information.

In order to include the totality of entities of the Colombian financial system in the analysis (entities that do not make part of any conglomerate), additional groups to the conglomerates identified are made by type of business (other credit institutions, other insurance companies, other trust companies, other brokerage firms and investment managers, other pension and severance funds managers, and other entities) whose source of information is the Office of the Financial Superintendent of Colombia. Thus, the study is performed on the basis of 28 groups.

### 4. Results

The methodology used to identify financial conglomerates of a greater systemic importance in Colombia shows the following results: Table B1.4 shows that conglomerates 1 and 2 are those with the highest indicators in the three components analyzed. The first exhibits the largest interconnection and complexity indexes, while the second is the largest in size. From the third conglomerate identified, the systemic importance considerably decreases, which is associated with the result in the size index. Compared to 2013, the aggregate index of systemic importance by conglomerate is similar (Graph B1.1).

On the other hand, it is remarked that these results are consistent with those found in the work of identifying systemically important local entities<sup>2</sup>, in the sense that the

2 See Box 5: Entities of a local systemic relevance (BIS methodology), Financial Stability Report, September 2013.

Table B1.2  
Financial Conglomerates Composition

Conglo- merate	Banks	Other credit institutions	Pension and severance funds managers	Insurance companies	Stock brokerage firms and Inves- tment anagement companies	Trust companies	Real sector	External	Total	Number of sectors
1	1	4	0	0	1	1	8	43	58	6
2	1	2	1	0	1	2	21	9	37	7
3	1	0	0	0	2	1	0	16	20	5
4	1	0	0	0	1	1	3	2	8	5
5	1	0	0	0	2	2	0	1	7	4
6	1	0	0	0	0	1	1	2	5	4
7	0	0	0	0	1	1	1	2	5	4
8	1	0	0	0	0	1	0	2	4	3
9	1	0	0	0	1	1	0	1	4	4
10	0	0	1	1	1	1	0	0	4	4
11	1	0	0	0	1	1	0	0	3	3
12	1	0	0	0	1	1	0	0	3	3
13	0	0	0	0	1	0	0	2	3	2
14	1	0	0	0	0	0	1	0	2	2
15	1	0	0	0	0	1	0	0	2	2
16	1	0	0	0	0	0	1	0	2	2
17	0	0	0	2	0	0	0	0	2	1
18	0	0	0	1	0	1	0	0	2	2
19	0	0	0	2	0	0	0	0	2	1
20	0	0	0	2	0	0	0	0	2	1
21	0	0	1	0	0	0	0	1	2	2

Other credit institutions: AFP: pension and severance funds managers; SCB and SAI Stock brokerage firms and Investment management companies, and SFD: Trust companies.  
Sources: Consolidated balance sheets reported by the financial conglomerates on their websites; authors calculations.

Table B1.3  
Indicators for the Identification of Systemically Important Conglomerates for Colombia

Category	Variables	Weighting (percentage)
Size	Proprietary position assets	16.67
	Third-party position assets	16.67
Interconnection	Assets and liabilities positions in the money market	11.11
	Credits with other financial institutions	11.11
	Bonds	11.11
	Gross derivatives	11.11
Complexity	Proprietary position negotiable and available for sale investments	11.11
	Number of overseas subsidiaries	11.11

Source: authors' calculations.

Table B1.4  
Results  
(percentage)

Conglomerate	Size	Interconnection	Complexity	Total index
1	18.25	8.88	9.93	24.90
2	23.15	6.02	6.00	19.74
3	7.33	4.18	3.66	10.28
4	4.68	1.30	2.43	5.29
5	3.88	2.03	1.50	4.82
6	5.03	1.24	1.68	4.60
7	2.29	2.72	0.83	4.31
Other 1	3.15	1.81	0.44	3.30
8	4.78	0.39	1.00	2.98
Other 2	2.74	0.06	1.81	2.79
9	2.38	1.17	0.73	2.70
10	5.94	0.00	0.26	2.24
11	2.39	1.29	0.12	2.21
12	2.05	0.94	0.45	2.07
Other 3	4.46	0.00	0.01	1.50
Other 4	0.56	0.08	0.96	1.22
13	0.99	0.44	0.28	1.05
Other 5	0.49	0.75	0.02	0.93
Other 6	2.15	0.00	0.03	0.75
Other 7	0.82	0.00	0.38	0.66
14	1.66	0.00	0.08	0.63
15	0.48	0.00	0.26	0.42
16	0.04	0.00	0.26	0.28
17	0.15	0.00	0.15	0.20
18	0.02	0.00	0.03	0.04
19	0.06	0.02	0.00	0.04
20	0.05	0.00	0.02	0.04
21	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00

Source: authors' calculation.

entities identified in that exercise are part of the systemically important conglomerates identified in this box.

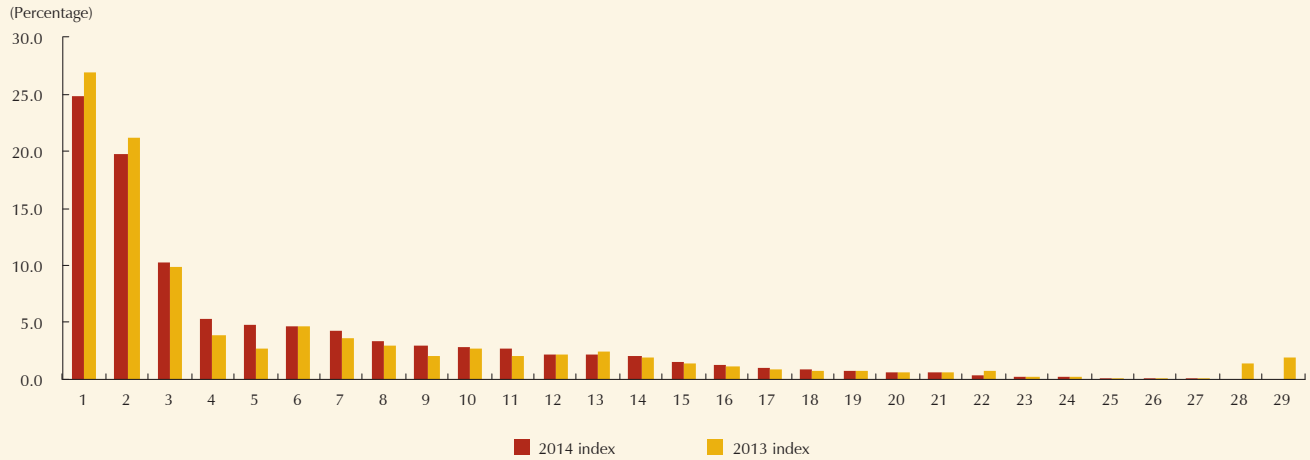
## 5. Conclusions

This paper presents a first approach to the identification of systemically important conglomerates in Colombia, along with the guidelines of the BCBS. Overall, the results show that systemically important conglomerates of a systemic importance are the largest size ones and, in

turn, those that gather systemically important local entities identified in a previous work. By applying the methodology proposed, the results were stable between 2013 and 2014.

To the extent that the information on these groups is more complete, the dimensions and variables considered could be extended, in order to have a more accurate measure of identification, which is highly relevant for public policy to promote financial stability, preventing financial crises and adopting suggestions from the BCBS.

**Graph B1.1**  
**Systemic Importance Index for the Financial Conglomerates in Colombia**



Source: authors calculations.

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## BOX 2

### INTEREST RATE RISK OF THE BANKING BOOK OF CREDIT INSTITUTIONS IN COLOMBIA

Wilmar Cabrera  
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Carlos Quicazán\*

#### 1. Introduction

The interest rate risk to which financial intermediaries are exposed has two dimensions. The first considers the effect of interest rates variations on the value of assets included in the treasury book<sup>2</sup>, such as negotiable investments in debt securities. The second dimension refers to the effect that changes in interest rates have on future cash flows of income and expenses of the assets and liabilities considered in the banking book<sup>3</sup>, for example, the credit loan portfolio, deposits, among others.

Under the current regulation, the first dimension of this risk is included in pillar 1 of supervision, and in Colombia there is a system of market risk management which considers this part of the of interest rate risk, while it is included in the capital requirements of financial intermediaries. On the other hand, regarding the interest rate risk in the banking book, the Basel Committee on Banking

Supervision (BCBS) recommends that this should be included in pillar 2, which refers to the review process of the supervisor, and of which its implementation in Colombia is being studied.

Thus, the purpose of this box is to characterize the exposure of credit institutions in Colombia to interest rate risks in the banking book. In this sense, given the nature of the financial intermediation business, which implicitly involves a maturity transformation, in which these institutions are funded in the short term, and invest these resources at a longer term, it is important to assess the effect of an increase in interest rates on the net interest income of the various entities.

For this analysis, it is relevant to examine the maturity structure exhibited in both the assets and the liabilities of credit institutions within the banking book, as well as its composition by currency and type of rate (fixed or variable). Finally, a measure that reflects the exposure to variable interest rate risk is calculated for different maturities, quantifying the mismatch between assets and liabilities sensitive to changes in this variable.

#### 2. Analysis of the term structure of credit institutions

When analyzing the composition of assets in the banking book of credit institutions as of June 2015, it was found that 76.9% have a duration between one and five years. When decomposing the assets by currency and type, it was observed that 85.8% is denominated in Colombian pesos and 50.9% at variable rates (Table B2.1). As for the main references to which variable rate assets are tied, it is noted that they are primarily focused on the 90-day fixed term certificates of deposits benchmark rate or DTF (69.9%), Real Value Units (7.2%), six-month Libor (5.9%) and IBR (5.5%).

As for the composition of liabilities, it is found that, as of June 2015, these had about 60% on a less-than-one-year term, with 90.6% share of the debt in Colombian pesos, and 25.7% at a variable rate (Table B2.2). The references that concentrate the largest amount of liabilities at a variable rate are IPC (35.8%), DTF (31.9%) and IBR (18.8%).

Additionally, in order to measure in which terms credit institutions are more exposed to increases in interest rates,

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\* The authors are part of the Financial Stability Department at *Banco de la República*. The views expressed do not reflect those of the Central Bank or its Board of Directors. Any errors or omissions are the sole responsibility of the authors.

1 For the preparation of this box, the information contained in Form 473, “*Estructura de tasas de interés del balance*” (“Structure of interest rates of the balance sheet”) of *Office of the Financial Superintendent of Colombia* was used; whose objective is to obtain information on the structure of the interest rate of the balance sheet by currency and type (fixed or variable) of credit institutions.

2 According to *Office of the Financial Superintendent of Colombia*, “The treasury book consists of the set of positions, resulting from treasury operations, which the company maintains with the aim of benefiting from price fluctuations in the short-term, as well as of those investments sensitive to fluctuations in the market variables. In this order, the blanket treasury book covers, among others, all negotiable investments and investments available for sale”.

3 *Office of the Financial Superintendent of Colombia* defines it as follows: “The banking book consists of the set of positions coming from: (i) the deposits operation of entities through current and savings accounts, time deposits, the issuing bonds, etc.; (ii) The credits loan portfolio; (iii) The constitution of endorsements and guarantees, (iv) investments to maturity, and, in general, (v) any operation that is not part of the treasury book”.

Table B2.1  
June 2015 Credit Institutions Asset Composition

	Percentage share	Legal tender		Foreign currency		Total	
		Variable rate (percentage)	Fixed rate (percentage)	Variable rate (percentage)	Fixed rate (percentage)	Variable rate (percentage)	Fixed rate (percentage)
0 to 1 month	1.5	1.8	93.9	0.0	4.3	1.8	98.2
1 to 3 months	1.1	29.2	42.8	0.0	28.0	29.2	70.8
3 to 6 months	2.9	63.7	21.7	14.0	0.6	77.7	22.3
6 months to 1 year	6.5	68.2	29.1	1.0	1.7	69.2	30.8
1 year to 2 years	29.0	44.1	48.0	6.7	1.2	50.8	49.2
2 years to 3 years	17.7	45.7	43.3	10.5	0.5	56.2	43.8
3 years to 5 years	30.2	43.7	28.0	7.7	20.7	51.4	48.6
5 years to 10 years	7.8	36.9	58.0	5.2	0.0	42.0	58.0
More than 10 years	3.3	10.0	90.0	0.0	0.0	10.0	90.0

Source: Form 473 of Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

the weighted average term to maturity (WATM) Gap was calculated. This measure is defined as the difference between assets and liabilities subject to change in the interest rate for the term analyzed, weighing the accounts for the time in which the rates change would have effect on income and interest expenses.

$$WATM\ Gap_T = ASR_T - PSR_T$$

$$ASR_T = \sum_i AF_i \left( \frac{T-D_i}{T} \right) + \sum_i AV_i$$

$$PSR_T = \sum_j PF_j \left( \frac{T-D_j}{T} \right) + \sum_j PV_j$$

Where  $ASR_T$  and  $PSR_T$  correspond to the value of assets and liabilities whose income and expenses are subject to changes in the interest rate in a determined  $T$  horizon. In turn,  $D$  represents the average duration of asset  $i$  and liability  $j$ ,  $AF_i$  and  $AV_i$ , the value of the assets denominated at a fixed and

variable rate respectively, and  $PF_j$  and  $PV_j$ , the value of liabilities denominated at a fixed and variable rate in that order. For example, if it is assumed that the  $WATM\ Gap$  on a  $T = 1$  year horizon of an entity with the following assets and liabilities on its banking book wants to be calculated (Table B2.3).

For this calculation, the first step is to identify the assets and liabilities at a fixed rate sensitive to changes in the interest rates in the analyzed horizon. These items must be weighted in the time left for their maturity if this is lower than  $T$ . Subsequently, variable rate denominated assets and liabilities are added, thus obtaining:

$$ASR_T = \sum_i AF_i \left( \frac{T-D_i}{T} \right) + \sum_i AV_i$$

$$ASR_T = 35 [1 - (1/365)] + 125 [1 - (90/365)] + 250 + 15 = 394,1$$

$$PSR_T = \sum_j PF_j \left( \frac{T-D_j}{T} \right) + \sum_j PV_j$$

$$PSR_T = 75 [1 - (75/365)] + 200 [1 - (300/365)] + 55 + 180 = 330,2$$

Table B2.2  
June 2015 Credit Institutions Liabilities Composition

	Percentage share	Legal tender		Foreign currency		Total	
		Variable rate (percentage)	Fixed rate (percentage)	Variable rate (percentage)	Fixed rate (percentage)	Variable rate (percentage)	Fixed rate (percentage)
0 to 1 month	21.4	3.6	95.5	0.0	1.0	3.6	96.4
1 to 3 months	5.8	49.7	43.4	2.9	4.0	52.5	47.5
3 to 6 months	7.4	23.2	76.0	0.6	0.2	23.8	76.2
6 months to 1 year	24.6	26.4	65.9	1.9	5.8	28.3	71.7
1 year to 2 years	16.4	35.7	50.2	9.1	5.0	44.8	55.2
2 years to 3 years	6.4	14.7	82.5	2.8	0.0	17.5	82.5
3 years to 5 years	16.1	22.8	52.2	0.8	24.2	23.6	76.4
5 years to 10 years	1.1	42.3	53.5	3.5	0.7	45.9	54.1
More than 10 years	0.7	54.9	3.1	0.0	41.9	54.9	45.1

Source: Form 473 of Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

Table B3.3  
Bank Book Example

Type of asset	Amount	Maturity	Type of liability	Amount	Maturity
Fixed-rate credit	35	1 day	Variable rate deposit	55	60 days
Fixed-rate credit	125	90 days	Variable rate deposit	180	180 days
Variable rate credit	250	180 days	Fixed-rate deposit	75	75 days
Fixed-rate investment	85	2 years	Fixed-rate deposit	200	300 days
Variable rate investment	15	8 years			

Source: authors' calculations

$$WATM\ Gap_T = 394.1 - 330.2 = 63.9$$

Therefore, in this example, because the entity has a positive *WATM Gap*, an increase in the interest rate would lead to higher net interest income and vice versa.

This measure was calculated by type of credit institution increasing in the amount of its assets, for *T* values between one month and ten years. As shown in Graph B2.1, the mismatching structure exhibited by credit intermediaries differs by type of business, and no significant variations between December 2014 and June 2015 occur<sup>4</sup>. Specifically, the *WATM Gap* indicator takes positive values for commercial banks, which is mainly explained by the higher value of variable rate assets, compared to the liabilities at such rate (\$ 163.2 trillion and \$ 69.4 trillion respectively).

Additionally, it is emphasized that financial corporations and cooperatives have negative values in this indicator, with the highest shares within their total assets, which makes them more vulnerable to increases in interest rates. Moreover, the set of credit institutions exhibits negative values for terms between two and five years, although the size of this *Gap* indicates a low vulnerability level to such shocks (-3.4% of assets to a three years term).

In order to quantify the level of vulnerability to the interest rate risk in the banking book for credit institutions, possible losses to a 200 basis points increase for a three years horizon were calculated, a term in which credit institutions exhibit the greatest vulnerability. Results suggest that these represent 1.3% of the annualized earnings as of June 2015.

It is important to note that when using the *WATM Gap* for calculating the losses, it is assumed that entities maintain the maturity structure of their portfolio constant (they renew matured operations), while for variable rate assets, it is considered that the adjustment in income from changes in the interest rate is performed immediately.

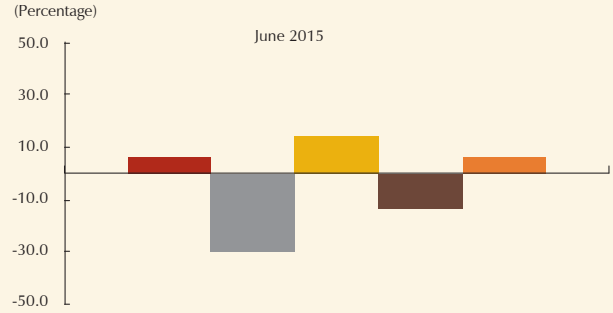
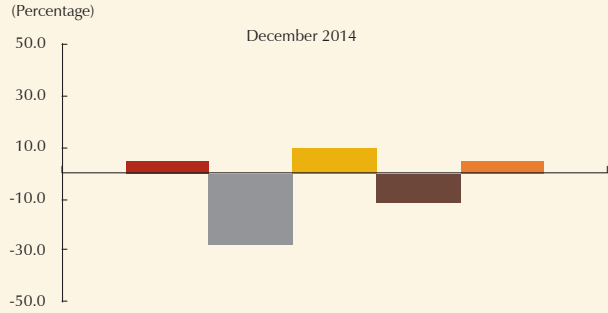
This box constitutes a first approach to characterizing the interest rate risk in the banking book. In general, as of June 2015, credit institutions registered a positive *WATM Gap*, indicating that these entities, under the assumptions employed, do not present a significant risk to interest rates increases in their banking book. It is important to note that the analysis performed only estimates the effects on the income statement of the entities. To complement this analysis, it is necessary to consider the effects that changes in interest rates may have on the equity value of the entities.

4 It is important to highlight that when performing the aggregate calculation by type of credit institution, individual exposures to interest rate risk might be compensated. However, this calculation is a central tendency measure, as it is equivalent to a size-weighted average of the exposure of each entity.

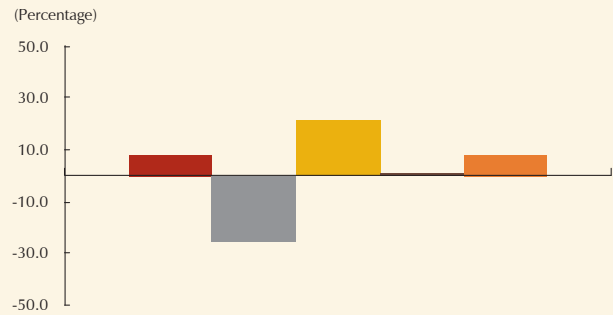
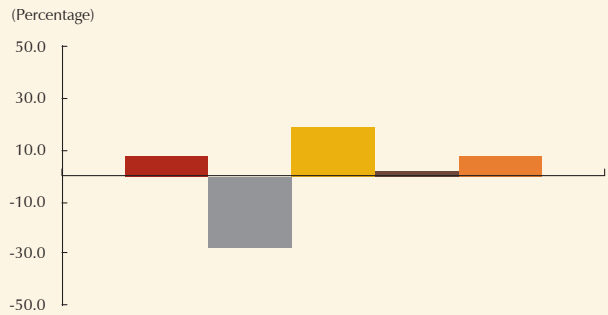


Graph B2.1  
Weighted Average Term to Maturity Gap (WATM gap) by Credit Institution Type

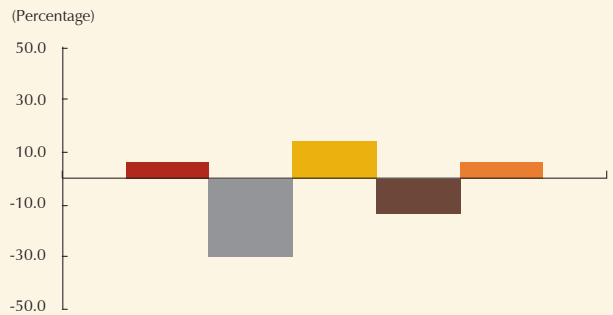
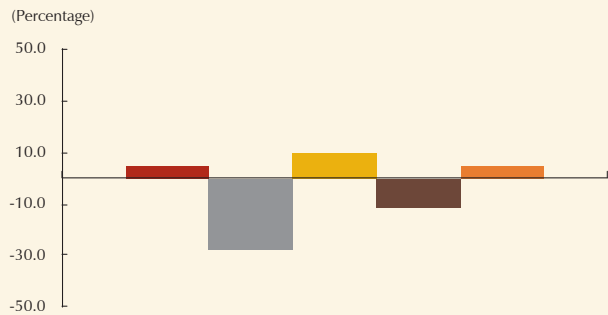
A. 1 Month



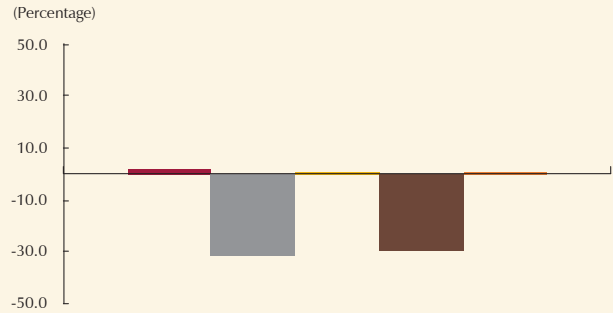
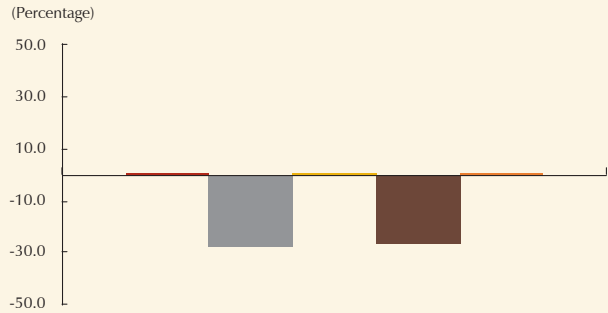
B. 3 Months



C. 6 Months



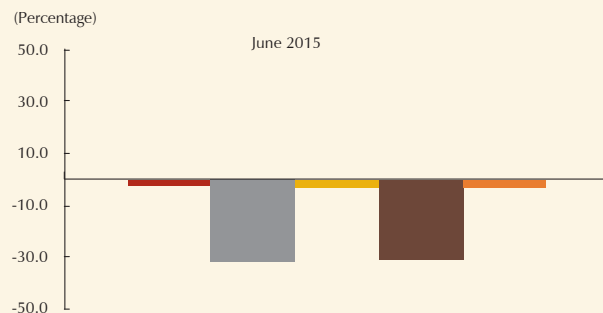
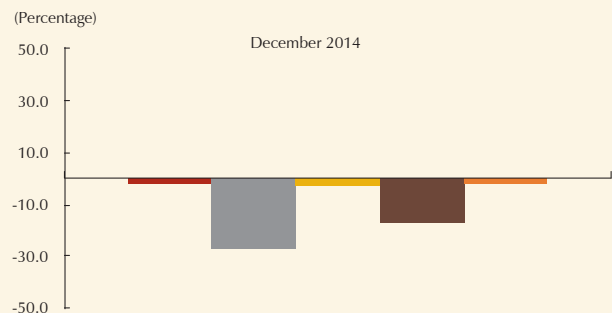
D. 1 year



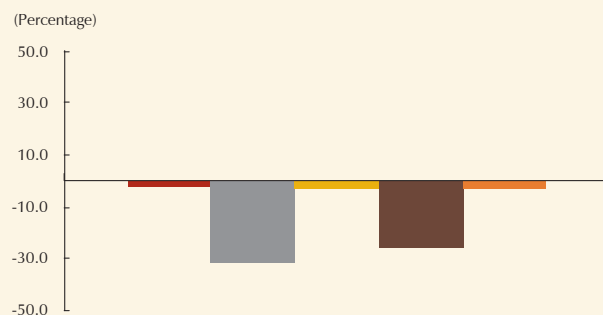
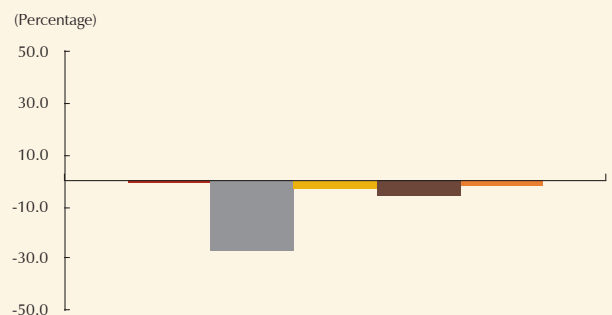
■ Bancos ■ CF ■ CFC ■ Coop ■ Sistema

Graph B2.1 (continued)  
Weighted Average Term to Maturity Gap (WATM gap) by Credit Institution Type

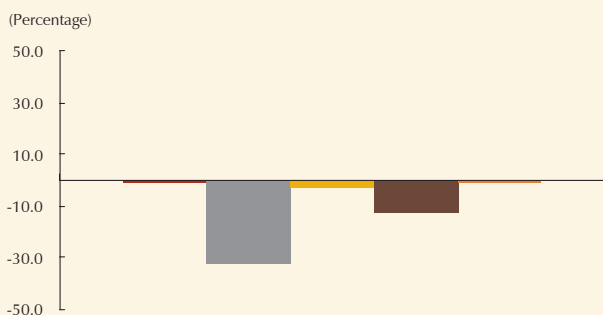
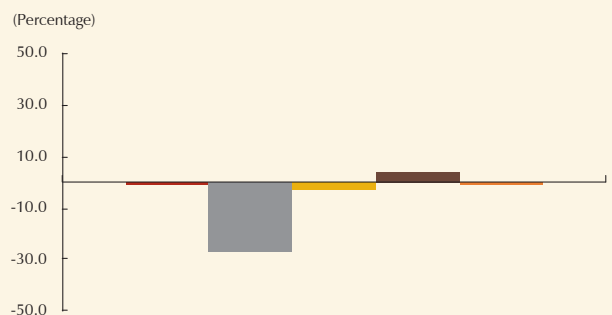
E. 2 Years



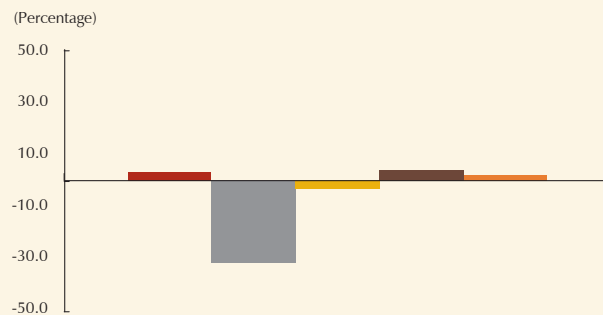
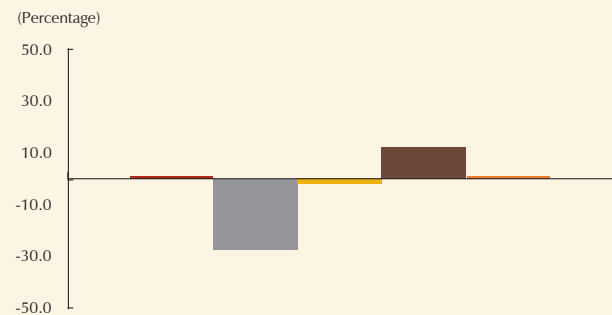
F. 3 Years



G. 5 Years



H. 10 Years



■ Bancos ■ CF ■ CFC ■ Coop ■ Sistema

Source: Form 473 of Office of the Financial Superintendent of Colombia; calculations by Banco de la República.

### BOX 3

## INCORPORATION OF RESOURCES TO THE NATIONAL ACCOUNT AND LIQUIDITY OF THE FINANCIAL SYSTEM

Javier Pirateque  
Jorge Hurtado\*

would be *Banco de la República* through the CUD account of the General Treasury.

### 1. Introduction

This box assesses the effects that the incorporation of all public entities that are part of the General Budget of the Nation into the National Account System (*Cuenta Única Nacional-CUN*) can bring on the liquidity of the financial system. In order to do this, a brief introduction explains the changes in liquidity management introduced in 2005 and some generalities about the CUN. In the second section, the way in which *Banco de la República* delivers liquidity is explained; and the third section discusses the possible effects of the CUN in the liquidity of the economy.

In June 2005, *Banco de la República* and the *Dirección General de Crédito Público y del Tesoro Nacional* (DGCPTN) agreed that any surplus in Colombian pesos of the DGCPTN would be deposited at *Banco de la República*. This aimed to improve the distribution of liquidity in the market, as well as to eliminate the operational and credit risk that conducting repo operations with the financial institutions implied to the DGCPTN<sup>1</sup>.

Later, with the purpose of making the management of the nation's resources by the DGCPTN more efficient, Act 1450 of 2011 established that the organs that are part of the General Budget of the Nation should manage their income and capital resources through the CUN.

The regulation of the CUN is summarized in Decree 1068 of 2015 (Single Regulatory Decree of the Finance and Public Credit Sector), which defines that the maximum deadline for transferring proprietary and third party resources and special funds of entities that are part of the General Budget of the Nation to the CUN, was 31 December 2015. Also, it was established that the only entity that could act as depositary agent of the resources

Regarding the resources of the entities invested in TES or other securities, the regulation states that if these are not generating capital losses, they must be included as income for the Nation through the CUN with their value at market prices, transferring the rights incorporated in such securities with the *Depósito Central de Valores* (DCV) in favor of the nation. If the securities are generating capital losses, then the returns, dividends or amortizations generated should be incorporated into the Nation through the CUN, up to when they stop presenting losses, moment at which the referred procedure will be followed.

Because the process of incorporating resources to the CUN has raised questions regarding its impact in terms of market liquidity, *Banco de la República's* liquidity scheme and how it will respond to this adjustment is exposed hereinafter. Next, the expected effects of such change in the liquidity of the financial system are assessed.

### 2. *Banco de la República's* liquidity scheme

*Banco de la República* has three instruments to perform liquidity expansion operations related to monetary policy: expansion repos, permanent liquidity facility (window), and final TES purchases. The use of each one responds to the operability of the implementation of the monetary policy, which seeks for the interbank interest rate of the market to be very close to *Banco de la República's* benchmark rate, all this framed within the target inflation scheme.

The expansion repos, which are granted through auctions, are the main instrument for *Banco de la República* to provide liquidity. These are operations by which liquidity is delivered in exchange for a security, which is usually a TES. Usually, they are made within a one-day term, but in periods when *Banco de la República* should temporarily provide liquidity on considerable amounts, they are performed at longer terms (e.g. seven or fourteen days). Specifically, the final purchase of TES is performed when projections indicate that the economy will permanently need the liquidity provided by *Banco de la República*. Finally, the window is a permanent instrument of repo operations at which counterparties can go for resources with an unlimited amount, within a one-day term, but at a rate above the reference.

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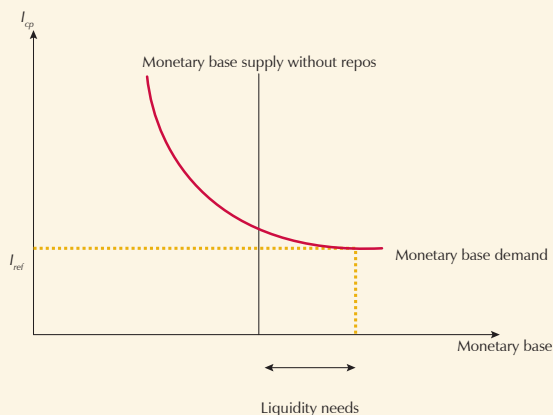
\* The authors are, in this order, specialized professional and professional at the Financial Stability Department of *Banco de la República*. The views expressed here do not compromise the Bank nor its Board of Directors. Errors or omissions that remain are the sole responsibility of the authors.

1 For a more detailed review of the liquidity supply scheme introduced in 2005, see Box 1 of the Report of the Board of Directors to Congress of July 2005.

Since the interest rate on the interbank market (ICP) is defined in the primary liquidity market according to the supply and demand of liquid resources, monetary programming is established with the aim of ensuring that the interbank interest rate (ICP) does not deviate from the policy interest rate or of reference rate (IREF). Thus, *Banco de la República* calculates the permanent supply of monetary base (that is, the supply without repos) and projects its demand, so as to provide the estimated liquidity needs or to contract the surpluses through these operations, according to the case. Mathematically, these demands or surpluses correspond to the difference between the demand and supply projections of the monetary base (without repos) (Graph B3.1).

Estimates of monetary base demand are made using econometric exercises, while supply calculations are made from the balance sheet accounts of *Banco de la República*. Thus, expected increases in non-monetary liabilities of the Central Bank such as those from the deposits of the DGCPTN or from the non-reserve paid deposits (DRNCE, in Spanish) reduce the calculation of

Graph B3.1  
Fixed Rate TES Yield Curves



Source: *Banco de la República*.

the supply of the monetary base, while increases in assets (e.g. purchases of international reserves) increase it<sup>2</sup>.

By way of illustration, Table B3.1 features the market liquidity demand projections of *Banco de la República* with information as of October 6, 2015. As explained, the calculation of the repos is based on the difference between demand for liquidity and its supply. It can be seen that much of the liquidity is associated with the category “other” which mainly comes from purchases of international reserves made by *Banco de la República* throughout time. Also, it can be noted that, to the extent that the DGCPTN deposits decrease, so does the share of repos, *ceteris paribus*, as this increases the monetary base supply.

In case there were additional liquidity needs not covered by *Banco de la República*'s operations, the interbank rate would face increase pressures. The opposite would occur if the necessary contraction operations were not made. Graph B3.2 shows that, despite some particular events and of a temporary nature, the interbank rate has been aligned with the benchmark rate, which means that the liquidity needs of the system have been adequately covered. It can also be noted that during the month of October, a transitional liquidity pressure event occurred, which seemed to have mitigated by the end of the same month.

A possible explanation for the liquidity situation mentioned above, seems to be associated with the behavior of the DGCPTN deposits at *Banco de la República*. As may be seen in Graph B3.3, the latter were at high levels since mid-September, mainly as a result of the concentration of payments that the DGCPTN must perform in the last quarter of the current year, especially those associated with TES maturities by COP \$9.6 trillion on October 28, and by COP \$3.2 trillion in November (the latter being monetary control TES). Therefore, the increase in

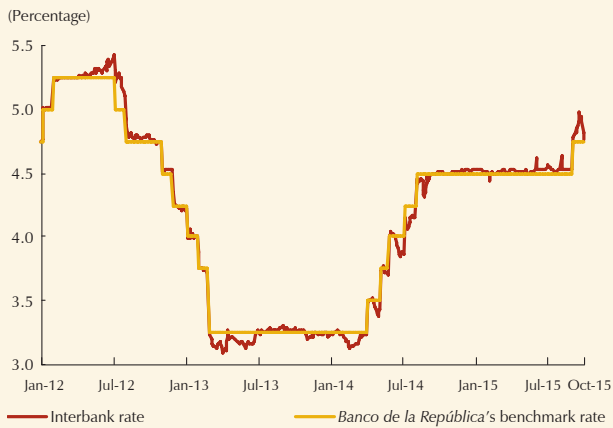
- 2 Increases in the assets of *Banco de la República* increase the monetary base, as long as the transaction has a monetary effect.

Table B3.1  
Demand Projections by Market Liquidity  
(Trillion Colombian Pesos)

Month	Demand (A)	General Treasury of the Nation deposits (B)	TES deposits monetary control (C)	Other (D)	Supply (B + C + D) (E)	<i>Banco de la República</i> repos (A – E)
October	74	-18	-8	86	60	14
November	73	-8	-6	86	72	1
December	78	-6	-5	86	75	3

Note: approximate data.  
Source: *Banco de la República*.

**Graph B3.2**  
Interbank Rate and *Banco de la República's* Benchmark Rate



Source: *Banco de la República*.

the balance of deposits observed as a result of the transfer of tax collection from the accounts of contributors to the deposit account of the DGCPTN has not yet returned to the market. It is noteworthy that the behavior of the deposits of the DGCPTN described above, characterized by accumulation peaks until the end of the third quarter and disaccumulation in the last quarter, is not an isolated phenomenon, and has been happening in the last 4 years, indeed (Graph B3.4).

The transfer of resources from accounts in financial institutions to the DGCPTN for tax collection and other income can modify the sources of funding of entities, although it is expected that this situation will normalize once the

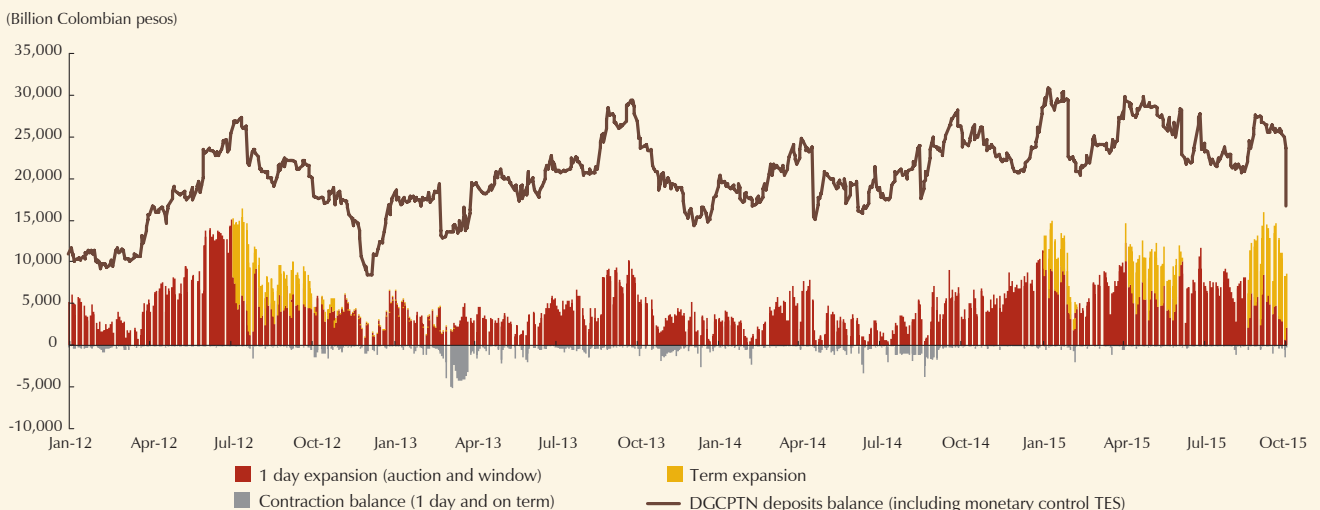
payment of the TES with maturities in October and November already referenced is made. In any case, *Banco de la República* has expanded term operations to help solving temporary situations such as the one described<sup>3</sup>. Indeed, Graph B3.3 shows the increase in transitory expansion operations during October, specifically term operations, compared to the levels granted in the other months of 2015<sup>4</sup>. It is highlighted that the replacement of funding sources can change their costs, if entities compensate their lower deposits with repos from *Banco de la República*.

**3. Possible effects to the incorporation of resources from the CUN in the liquidity of the financial system**

Moving resources to the CUN involves a transfer of cash or investments by entities of a national order to be centrally managed by the DGCPTN. Thus, liquid assets that entities held in the financial system will be transferred to *Banco de la República* in the form of deposits to the DGCPTN, and the rights of investments in TES or other securities will go on behalf of the nation to the DCV.

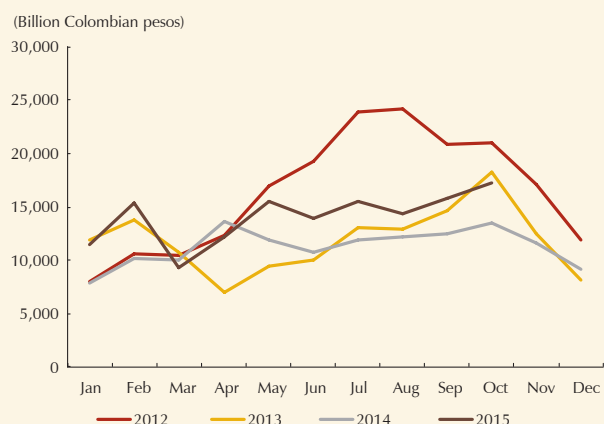
- 3 The most used terms in these kinds of operations are seven, fourteen and thirty days.
- 4 When comparing the daily granted amounts in transitory expansion operations (1 day and on term), it is observed that, on average, during the month of October *Banco de la República* granted around \$ 3.6 trillion more than in the remaining of 2015. In term operations, the difference reached near \$ 5.9 trillion.

**Graph B3.3**  
Transitory Liquidity Expansion Operations and Deposits of the DGCPTN



Source: *Banco de la República*; author's calculations.

Graph B3.4  
DGCPTN Deposits at *Banco de la República's* Balance:  
Monthly Average



Source: Banco de la República.

In December 2014, entities of the national order maintained a balance of COP\$ 432.4 billion in deposits in credit institutions, for which it is expected that a similar amount will not be available to credit institutions in December 2015, given the period of implementation of the CUN. Nonetheless, the share of the deposits of entities of the national order in the total deposits of credit institutions is 0.15%, so the impact of their withdrawal on the funding structure of such institutions is not significant.

In any case, it should be considered that an important part of the resources that have been transferred to the DGCPTN due to the implementation of the CUN have returned to the financial system through transfers resulting from budget execution. Similarly, during the implementation of the CUN state entities are in charge of the collection of their own revenues, according to the description in Article 2.3.1.3 of Title I of part 3 of Decree 1068 of 2005, as well as the reciprocity agreements kept with each financial institution. That is, the same collecting accounts are being used in the collection process. An example of this is that, according to information of the

DGCPTN, between January 2014 and September 2015, the difference between income and payments of the CUN was of COP\$195 billion, which suggests that the net effect of these transfers has not been important. However, although liquidity has not been affected at the aggregate level, there may have been a redistribution of resources among the entities that administered them.

On the other hand, it should be recalled that, as explained before, *Banco de la República* takes into account the level of deposits of the DGCPTN to calculate liquidity needs, so an increase is reflected in the rise in the shares on the expansion auctions. In fact, as may be seen in Graph B3.3, the level of deposits of the DGCPTN is positively correlated with the amount of liquidity granted by *Banco de la República* through its transitory expansion operations.

Finally, the transfer of securities required by the CUN has no impact on the liquidity of the financial entities, to the extent that these have only acted as direct depositors with the DCV and, therefore, cannot use such securities to fund themselves in the money market.

As a conclusion, the incorporation of resources to the CUN has had positive effects in terms of efficiency in the management of the national budget because it has facilitated payments, collection, and administration without significantly affecting the availability of liquid resources in the financial system. Despite this, the implementation of the system could have created a redistribution of liquidity among entities. Additionally, it is remarked that the pressures observed in the market since mid-September and until late October should start to mitigate to the extent that the payments of TES maturities are made, thus decreasing the funding needs through operations with *Banco de la República*. In fact, the convergence of the interbank rate towards *Banco de la República's* benchmark rate in the last days of October gives signals of said normalization. Either way, *Banco de la República's* liquidity scheme ensures that in any temporary circumstance, solvent institutions can satisfy temporary liquidity needs.

### III. SENSITIVITY TESTS

*The identification of the vulnerabilities of the financial intermediaries around the slowdown of the economic growth, the exchange rate and the unfavorable dynamics of the capitals market observed during the first half of 2015 and described in the previous sections of this Report, highlights the need to evaluate the response of these entities to a negative impact on these dimensions. Therefore, this section shows the results of two sensitivity tests that seek to measure the strength of the financial intermediaries to adverse scenarios that exacerbate the mentioned risks. The results of these exercises show that neither the added solvency indicator nor the liquidity risk indicator of the system would be below the established legal limits. The entities that are most individually affected, have a low share in the total assets of the credit institutions, so a risk to the financial system as a whole is not observed.*

#### A. STATIC SENSITIVITY TESTS

##### 1. Sensitivity to market risk<sup>39</sup>

This section will analyze the exposure of entities of the financial system to variations in the price of TES, fixed income securities issued by private companies, and shares of domestic issuers, which are part of their investments, given that these variations can significantly affect their balance sheet and thus affect the stability of the system.

It is important to highlight that, in the case of the third party position of pension and severance funds managers, the measures presented are not the most appropriate to analyze the vulnerability to which the portfolios are exposed, since the fall in their value does not constitute the main risk to the contributor. Indeed, this risk is associated with achieving a greater replacement rate, defined as the ratio between the value of the pension and the wage received in the working stage close to the time of retirement. For example, the access of a future pensioner to a lifetime annuity scheme depends on that, by the time of retirement, the savings (which equal to the value of the portfolio) have been sufficient to cover the cost of acquiring such benefit. Since the value of the lifetime annuity depends on factors similar to those that determine the value of a portfolio consisting of long-

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<sup>39</sup> For additional tests concerning this section, it is suggested to consult the corresponding special report, published on the website of *Banco de la República* ([www.banrep.gov.co](http://www.banrep.gov.co)).

term instruments, the longer duration the investments of the third-party positions of the pension and severance funds managers have, provide a natural hedge to contributors, allowing for the value of savings and the cost of the pension to move in the same direction. Therefore, short-term movements in the value of the portfolio do not reflect changes in the risk exposure of the contributors and, therefore, this type of entities are not included in the tests.

This sensitivity test consists in calculating potential losses in the value of the portfolio of the entities of the financial system to increases in the discount rates on fixed income securities and depreciation in the shares issued by domestic firms. For debt securities, a 200 basis points increase for all maturities in the zero-coupon curve of TES was assumed, both in Colombian pesos as in real value units (UVR in Spanish)<sup>40</sup>, and in the margin for the case of private debt securities<sup>41</sup>, which is the shock suggested by the Basel Committee on Banking Supervision<sup>42</sup> for such tests. On the other hand, the possible losses of the shared portfolio were calculated, assuming an impairment equivalent to 19.99%<sup>43</sup>. Results show that, in August 2015, the proprietary position of the entities would record a \$ 4.47 trillion loss, slightly exceeding that calculated for February, while for the third party position a decrease would take place (Table 6). It is important to highlight that the increase in the duration observed in Chapter II plays an important role in the losses of the institutions. For example, despite the fall in the balance of banks' debt securities, these record an increase in losses due to the shock because of a significant increase in their duration.

In order to show an order of magnitude for these figures, losses are shown as a percentage of equity. Although financial corporations and stock brokerage firms in a proprietary position significantly reduced their exposure, the aggregate of the financial system kept losses close to 4.5% as a percentage of its equity (Table 6).

## 2. Sensitivity to credit risk

The purpose of this section is to present a static stress test to evaluate the potential impact of deterioration in the payment capability of certain

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40 For the UVR TES, an increase in the real margin over the UVR reference rate is supposed. If it were an increase in inflation expectations, losses would only occur in fixed-rate TES, since the real return of the security in UVR would not change.

41 For more information on the private debt test, box 4, "Private debt market risk", can be consulted.

42 See Annex 3 of the document: *Principles for the Management and Supervision of Interest Rate Risk, 2004* ([www.bis.org/publ/bcbs108.htm](http://www.bis.org/publ/bcbs108.htm)).

43 Maximum value at risk (VaR) at 95% with a one-day horizon of the Colcap index, using the available history of tradable days of the indicator.



Table 6  
Losses Due to Devaluation in the Debt and Local Shares Portfolio

	Losses (trillion Colombian pesos)		Losses over equity (percentage)	
	Feb-15	Aug-15	Feb-15	Aug-15
Credit institutions				
Commercial banks	1.92	2.04	3.15	3.22
Financial corporations	0.37	0.27	6.87	5.16
Financial cooperatives	0.01	0.01	0.16	0.17
Non-banking financial institutions	0.00	0.00	0.01	0.02
Proprietary position pension and severance funds managers				
Proprietary position stock brokerage firms	0.03	0.03	0.99	1.18
Third party position stock brokerage firms	0.05	0.05	6.28	5.24
Proprietary position trust companies	0.62	0.48	5.07	3.90
Third party position trust companies	0.24	0.28	12.20	14.32
Insurance and capitalization companies	13.82	13.54	5.06	4.87
Proprietary system	1.77	1.79	3.86	4.09
System	4.39	4.47	3.61	3.67
Sistema	18.82	18.49	4.63	4.49

Source: Depósito Central de Valores (DCV), Office of the Financial Superintendent of Colombia (Form 351) and Infovalmer; calculations by Banco de la República.

debtors, and a decrease in the value of the investment portfolio on the capital adequacy ratio, the profitability and the liquidity of these intermediaries.

In the first case, the impact of deterioration in the rating of the loans of debtors identified in Chapter II of this report, which could be susceptible to deterioration in their payment capability, was estimated. A decrease in the credit rating of these debtors generates an increase in provision expenses and a decrease in interest income, affecting the solvency of the institutions analyzed via capital<sup>44</sup>. Also, since the risk weighted assets (RWA) take into account the loan portfolio net of provisions, an increase in these would lower the denominator of capital adequacy ratio<sup>45</sup>.

In this test, an extreme scenario in which the group of interest loans decreases its rating is assumed: loans rated as A become B, the B ones become C, and so on. One of the assumptions of this test is that credit institutions will provision

44 The capital adequacy ratio is defined as the ratio between technical equity and risk level weighted assets and a market risk variable.

45 Sometimes, solvency could increase under this scenario, since the effect on the risk level weighted assets may be greater than the effect on the technical equity.

within an accumulation framework, constituting both the individual pro-cyclical component as the individual counter-cyclical component<sup>46</sup>.

In the case of the commercial loan portfolio, it was assumed that all the loans analyzed would pass to the following worst rating. The group of analyzed loans corresponds to those granted to companies in a winding up resolution, those with a lower than 2 interest hedging ratio (for more information see chapter II, Credit risk section) and the sub-sectors of agricultural, mining (except for metalliferous minerals extraction), and transport activities. Additionally, loans of net importing firms and foreign currency debtors that do not perform foreign trade operations were included, which would present a decrease of more than 30% in the value of their equity of December 2014 if facing a 40% depreciation with respect to the exchange rate of June 2015.

The commercial loan portfolio of this group of companies amounted to \$50.4 trillion, which in June 2015 accounted for 25.2% of the total of this type of credit. Within this loan portfolio, 88.4% is rated as A and exhibits a quality indicator of 11.6%, which is above the commercial loan portfolio total (6.6%). However, the default indicator of the group of loans of the analyzed companies was at 0.9%, a figure lower than that recorded by the total of this loan portfolio (2.3%).

As for the consumer loan portfolio, the test was carried out for the credit card and car modalities, assuming that deterioration in the rating takes place in 10%<sup>47</sup> of the total balance in each risk category. That is, 10% of the balance rated as A, passes to B, 10% of the rated as B passes to C and so on. As a proportion of the total balance of the consumer loan portfolio as of June 2015, credit cards accounted for 11.9% (\$ 11.2 trillion), and car loans 21.3% (\$ 20.1 trillion), so the rolling would be for a \$ 1.1 trillion and \$ 2 trillion balance respectively<sup>48</sup>.

To complement this adverse scenario and consider the market risk to which credit institutions are exposed, possible losses that these entities must face to an increase in the zero-coupon curve of 200 basis points (government bonds) and the margin (private debt) were considered, as well as an impairment of 19.99% of share investments (for more information see the Market risk section of chapter II). These losses would have an additional effect on

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46 For a more detailed description of this provision scheme, see chapter II of the Financial and Accounting Basic Circular by the FSC.

47 10% corresponds to the maximum decrease observed in the participation of the current loan portfolio over a two-year period for this modality, which was recorded between November 1997 and November 1999.

48 This data does not correspond to the 10% of \$ 11.2 trillion and \$ 20.1 trillion respectively, since the loan portfolio that is in E is not rolled.

the profits of these institutions, which would affect their profitability and solvency.

In analyzing the results under the joint hypothetical scenario, in which the loan portfolio of the analyzed groups is rolled and an adverse scenario in the public, private and equity debt markets is presented, it is noted that a commercial bank and three finance companies would end with a solvency indicator below the regulatory level (9%) (Table 7). To June 2015, the assets of these entities represent less than 1% of the total assets of the credit institutions. It is important to highlight that the greatest effect on the solvency is given by the deterioration in the rating of the analyzed credits.

When the effect of the proposed scenario in the return on assets (ROA) indicator is analyzed, by June 2015 this would decrease from 2.0%<sup>49</sup> to 0.3% for the credit institutions total, while the number of entities with a negative ROA would increase from 5 to 28. By type of entity, the ROA of commercial financing companies would be the lowest (Table 8).

**Table 7**  
Static Stress Test: Results on the Solvency of Credit Institutions

	Initial solvency	June 2015		Number of entities below 9%
		Stressed solvency (Percentage)	Solvency delta	
Commercial banks	15.45	14.98	(0.47)	1
Financial corporations	37.01	38.12	1.11	0
Commercial financing companies	12.54	13.07	0.53	3
Financial cooperatives	19.93	19.97	0.04	0

Sources: Forms 341 and 351 and financial statements of the Office of the Financial Superintendent of Colombia, *Depósito Central de Valores* (DCV) and *Infovalmer*; calculations by *Banco de la República*.

**Table 8**  
Static Stress Test: Results on the Return on Assets (ROA) of Credit Institutions

	Before the shock		After the shock	
	ROA (percentage)	Number of entities with a negative ROA	ROA (percentage)	Number of entities with a negative ROA
Commercial banks	1.96	2	0.30	14
Financial corporations	5.10	1	2.90	1
Commercial financing companies	1.41	2	(2.44)	13
Financial cooperatives	2.00	0	1.78	0

Sources: Forms 341 and 351 and financial statements of Office of the Financial Superintendent of Colombia, *Depósito Central de Valores* (DCV) and *Infovalmer*; calculations by *Banco de la República*.

49 This ROA does not match with chapter II because some entities for which it was not possible to calculate their annualized income were excluded.

### 3. Liquidity risk sensitivity

Based on the potential impact of the credit and market risks in the funding liquidity of the credit institutions impact, some tests that seek to measure the capability of these entities to face adverse liquidity scenarios were carried out. To perform this test, a thirty-day horizon liquidity risk indicator is used, defined as the ratio between liquid assets adjusted on foreign exchange risk and market liquidity, and the thirty-day net liquidity requirements<sup>50</sup>. It should be noted that the liquidity risk indicator incorporates deductions proper of a stressed scenario, so the proposed tests increase the intensity of such a situation.

The first exercise consists on deducting the decrease in the value of the adjusted liquid assets presented in the market risk test, which aims to take into account that should this risk materialize, the entities would count with less liquid investments to cover their short-term obligations, either by lower sale prices or by their lower value as collateral in money market operations.

Simultaneously, the increase in defaults, due to the rolling tests of the commercial and consumer loan portfolios is incorporated. This shock reflects the effects that the materialization of credit risk has on the liquidity risk, specifically on the lower contractual income flows that would be expected from this situation. These lower revenues are calculated based on a stressed default indicator applied to the loan portfolio projected flows.

Given the available information, the test was individually performed for banks, and in an aggregate manner for the other credit institutions. The individual test showed that one entity would present a liquidity risk indicator close to the regulatory minimum (100%) by applying both shocks to it. Meanwhile, in the aggregate test, the credit institutions would present a reduction of 8.5 percentage points in their liquidity risk indicator, mostly explained by the market risk shock (7.9 pp). By type of intermediary, financial corporations were the most affected by the simultaneous shocks, by registering a 133.7% liquidity risk indicator, after having shown a 144.5% indicator before the shocks (Table 9).

Since the uncertainty in financial markets about the possible loss of value of investments, can cause a massive withdrawal of the mutual funds, as happened in 2008 in the United States with the investment funds of the money market, a test is performed in which it is assumed that the redemption of shares within the mutual funds by investors generates a massive withdrawal of demand deposits

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<sup>50</sup> For further details on the calculation of the liquidity risk indicator of credit institutions, consult chapter VI of the Financial and Accounting Basic Circular of FSC.

Table 9  
Effects of the Market and Credit Risks Shock in the Liquidity Risk Indicator of Credit Institutions  
(percentage)

Type of intermediary	30-day liquidity risk indicator	Market risk stressed liquidity risk indicator	Credit risk stressed liquidity risk indicator	Market and credit risk stressed liquidity risk indicator	Stressed market and credit risk liquidity risk indicator and deposits withdrawals of credit institutions
Banks	294.84	286.63	294.19	285.99	257.50
Financial corporations	144.54	133.71	144.54	133.71	132.94
Commercial financing companies	174.99	174.83	174.38	174.21	174.21
Financial cooperatives	212.66	212.60	212.62	212.56	212.28
Credit institutions	280.17	272.31	279.56	271.72	247.32

Note: the liquidity risk indicator and the losses of value were taken with a closing date of August 28, 2015, and the loan portfolio data as of June 30, 2015.  
Sources: Office of the Financial Superintendent of Colombia and *Banco de la República*.

of these institutions from the credit ones<sup>51</sup>. Such withdrawal corresponds to the 20th percentile of the monthly percentage variation observed for demand deposits of mutual funds at credit institutions, which would increase the flow of non-contractual expenses of the entities at the closing date<sup>52</sup>. It should be noted that this test assumes that investors who redeem their shares in the mutual funds do not deposit these resources at credit institutions.

The results indicate that such withdrawals, along with the market and credit risk shocks, would reduce the liquidity risk indicator of credit institutions by 32.8 pp. By type of entity, the intermediaries that would be most impacted would be the banks, because most of the mutual funds have their deposits in such entities. Compared to the market and credit risks, this shock has more impact on funding liquidity due to the high share of non-contractual expenses in the net liquidity requirements. Finally, by entity, again, just one would show a level close to the regulatory minimum.

## B. DYNAMIC SENSITIVITY TEST

This section presents the results of a sensitivity test that combines the materialization of a set of risks in a dynamic way. The test calculates the potential impact that a hypothetical scenario of deterioration in the quality of the loan portfolio (credit risk), an increase in interest rates (macroeconomic risk) and restrictions on the renewal of funding sources (funding risk) would have in the financial system.

51 In June 2015, the share of the deposits in savings and current accounts of the mutual funds was of 6.4%.

52 In June 2015, the 20th percentile of the distribution of the monthly variations of the demand deposits balance of mutual funds in credit institutions corresponded to -20.1%.

This dynamic test differs from the previous static calculations in that the analysis is performed on the average composition of the loan portfolio of credits of each entity (and not by individual loans), so it does not recognize the effect of a stressed scenario on debtors that are considered vulnerable.

The dynamic sensitivity test is performed for a two-year time horizon since late June 2015, and is developed around the following five elements:

*i. Stress scenario*

The aim of the test is to calculate the effects on a set of variables of the financial system in a hypothetical scenario that combines the materialization of credit, macroeconomic and funding risks.

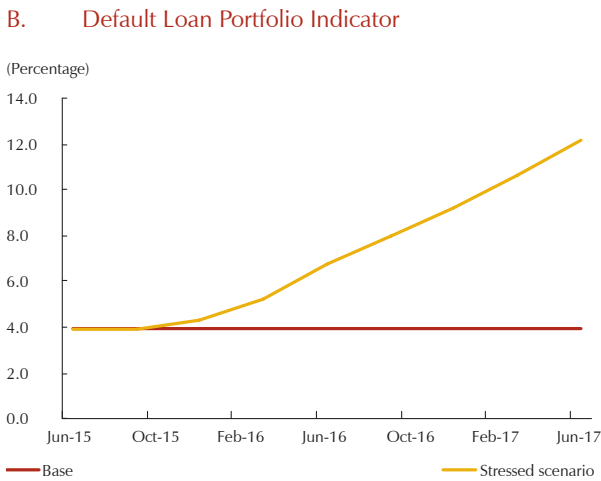
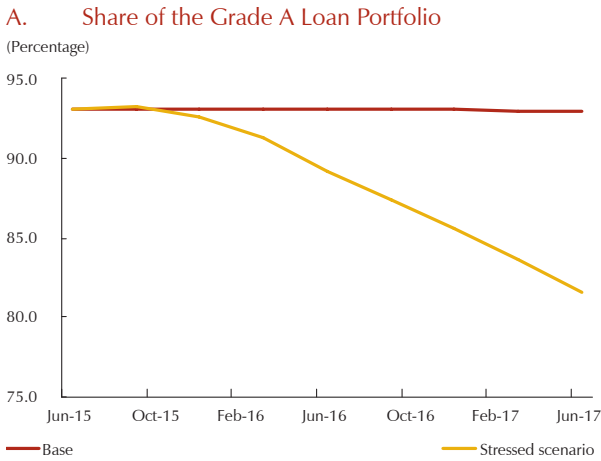
Regarding credit risk, the scenario considered corresponds to a massive decline in the rating (“migration”) of the loan portfolio of the financial institutions. The starting point is the composition of the loan portfolio in its different grades (A, B, C, D, and E) at the closing in June 2015. The greatest historical deterioration observed for a two-year horizon is applied to this initial composition, so that by the end of the horizon of analysis, the participation of the loan portfolio of a higher (lower) quality will be substantially lower (higher)<sup>53</sup>. This “stressed” composition is applied to the projected loan portfolio volume in the hypothetical scenario. This calculation is performed for the portfolio of each one of the types of credit: consumer, commercial, housing and microcredit. Graph 35 (panel A) shows the share of loans with the best rating (“A”) in the portfolio total, simulated during the horizon analysis: starting on the participation observed in June 2015 (96%), the hypothetical scenario considers a gradual reduction of about 12 percentage points in two years. Consistently, Graph (panel B) shows the projected evolution of the default indicator of the outstanding loan portfolio on the same scenario.

On its part, the macroeconomic risk materializes in a hypothetical increase in the interest rates of the economy. The scenario considers an increase in the short-term interest rate and assumes that the spread between the lending/deposits rates of the financial system and the short-term interest rate remains constant, so that the increase in the former is equivalent to the one on the latter.

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53 Specifically, it was found that the worst historical migration of the “outstanding” loan portfolio to “non-performing” corresponds to the period of the Colombian financial crisis, between November 1997 and November 1999 (time which the credit ratings scheme used today had not been introduced). This migration applies to the consumer, housing and commercial loans graded as “A” at the closing date of June 2015, and it is assumed that the proportion of loans portfolios of grade B, C, D and E proportionally increases. In the case of microcredit (nonexistent in the late nineties), the worst migration is applied using credit ratings, which happens to be for the one corresponding for the period between June 2012 and June 2014.

Graph 35  
Rolling of the Total Loan Portfolio in the Hypothetical Scenario



Source: Calculations by Banco de la República.

Finally, regarding funding risk, it is assumed that in the stressed scenario, financial institutions renew the amortized loan portfolio keeping the average portfolio duration constant, but they are only able to renew the liabilities of a less or equal than three months term, which reflects increasing difficulties to obtain long-term financing in this context. The reduction in the average duration of the liabilities causes an increase in the cost of funding sources, given the increase in the short-term interest rates. Since the increase in the lending rate is parallel (and the average duration of the loan portfolio remains constant), this implies a reduction in the net interest margin.

*ii. Profit reinvestment rule*

The test programs financial institutions to follow a profit reinvestment dynamic strategy during the analysis horizon, which is based on the one posed by other sensitivity tests in the international scope<sup>54</sup>. The strategy is different for the cases in which the entity considered presents financial surpluses and in those on which it shows losses. The existence of profits or losses depends on the profitability of the banking business and of the financial stress transmission mechanism, which will be detailed later.

When the entity presents profits, the strategy consists in trying to maintain the capital adequacy ratio observed at the closing of June 2015<sup>55</sup>. To do this, it is assumed that the entity maintains the capitalization of profits percentage, committed for the period of 2015. If that percentage is zero, the strategy of maintaining the capital adequacy ratio simply implies to maintain the volume of risk weighted assets constant. If the percentage is positive, the strategy implies increasing the volume of risk weighted assets granting loan portfolio. This increase is financed by an increase in liabilities, so that the leverage of the entity also grows in such case<sup>56</sup>.

54 Particularly in the RAMSI model principles employed by the Bank of England.

55 In other words, this capital adequacy ratio is considered optimal from the point of view of entity, to the extent that it was registered under financial and macroeconomic stability conditions.

56 Consequently, the reduction in the financial surpluses observed in the stressed scenario, will have the effect of reducing the expansion rate of the loan portfolio.

If the entity loses, the capital adequacy ratio tends to be reduced to the extent on which the losses reduce the equity tier 1. In this case, and in order to present more extreme results, it is assumed that the entity does not shrink its loan portfolio in order to increase the capital adequacy ratio.

*iii. Endogenous profitability*

The profitability of the banking business (associated with the net interest margin) was considered exogenous in the dynamic sensitivity tests presented in previous Financial Stability Reports. On this occasion, given the evolution of the structure of the interest rates discussed, profitability is endogenously determined as a result of the evolution of the loan portfolio and funding sources. The latter, as discussed before, are intrinsically determined by the surplus's reinvestment rule and under the constraint associated with the inability of the entities to find long term financing sources in the stressed scenario.

*iv. Transmission mechanisms*

The consequences of the hypothetical scenario are reflected in the capital adequacy ratio of individual entities through a set of transmission mechanisms. The assessment of the impact of the deterioration of the loan portfolio is based on the direct application of provision rules set out in the Colombian regulation, both in the use of credit ratings as in the distinction between counter-cyclical provisions accumulation and disaccumulation schemes<sup>57</sup>.

The first channel consists of a higher expense on provisions as a result of the migration of the loan portfolios. This higher spending tends to reduce solvency after its effect on profits. The second channel is the reduction of the RWA, as the loan portfolio is included in the capital adequacy ratio net of provisions. The third channel lies in the assumption that, in the stress scenario, entities enter into a disaccumulation phase of dynamic provisions, which tends to reduce provisions spending relatively. The increase in general provisions associated with the dynamics of the loan portfolio also have an effect on equity, to the extent that the regulation allows entities to account for up to 1.25% of the general microcredit and housing loan portfolio provisions as additional equity. Finally, the evolution of the profitability and the loan portfolio (as specified in previous subsections) affects both the surpluses as well as the volume of RWA, with the consequent effect on solvency.

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<sup>57</sup> For details of the regulatory scheme of the Credit Risk Management System (*Sistema de Administración de Riesgo Crediticio - SARC*) in Colombia, see chapter II of External Circular 100 of 1995 of FSC.

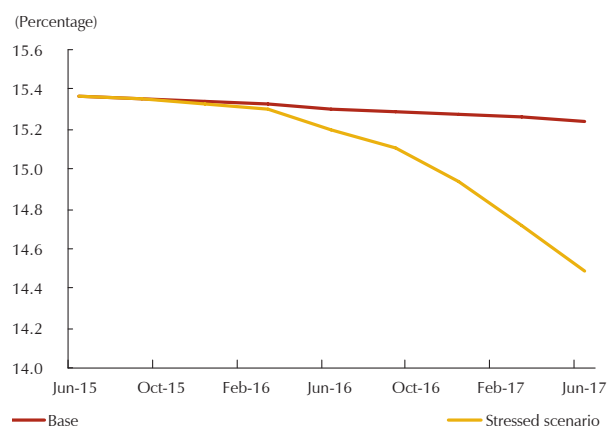


v. *Baseline scenario*

The evolution of the relevant variables of the financial system is compared to a “baseline” scenario, which serves as a reference framework for measuring the impact of the stressed scenario. In the base scenario, it is assumed that the composition of the loan portfolio by rating remains constant (as was observed at the closing of June 2015), that institutions are capable to keep the average duration of their liabilities constant<sup>58</sup>, and that the structure of interest rate remains constant. In short, the base scenario turns off the materialization of the considered risks<sup>59</sup>. The reinvestment rule is applied without modifications in this baseline scenario. It is important to highlight that the baseline scenario does not constitute in any way a forecast with a certain probability on the future evolution of the financial system. It only plays the role of serving as a reference to calculate the impact, and as a test scenario to judge the surpluses reinvestment rule in the absence of financial stress.

**Results**

Graph 36  
Capital Adequacy Ratio of the Financial System



Source: Calculations by Banco de la República.

Graph 36 shows the evolution of the capital adequacy ratio for all of the entities of the financial system during the analysis horizon in the stressed and base scenarios. In the first case, the capital adequacy ratio of the system is reduced by about 80 basis points towards the end of the horizon. This fall responds both to the expansion of the RWA, as for the reduction of equity by those entities which, as a result of financial stress, show losses. As for the base scenario, a slight fall of the capital adequacy ratio associated with the expansion of the RWA is observed. Panels A to D of Graph 37 show the evolution of solvency for the case of banks, financial corporations, commercial financing companies and cooperatives. The results are similar to those described.

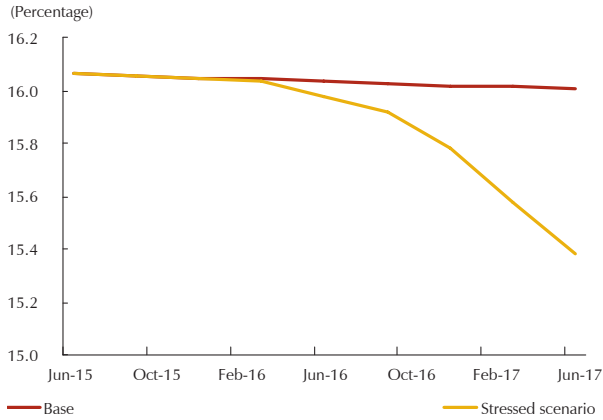
In the base scenario, no entity suffers a drop in its capital adequacy ratio below the regulatory minimum (9%). Under financial stress, the solvency of a group of entities falls below 9%, whose assets amounted to 6.6% of the total assets of the financial system, and the amount needed to recapitalize

58 That is, that manage to gain access to long term financing sources.

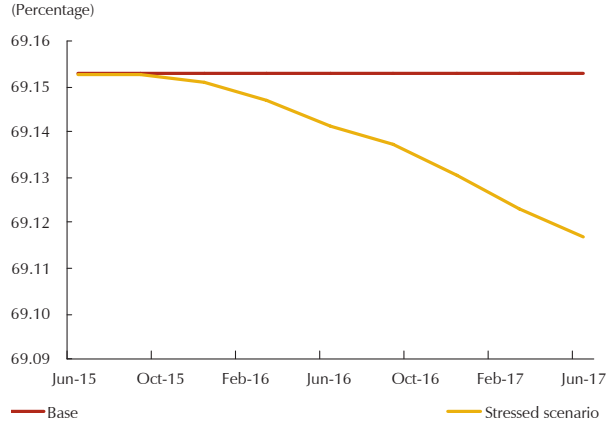
59 It is also assumed that, in the base scenario, the entities are in a cumulative phase of dynamic provisions.

Graph 37  
Capital Adequacy Ratio by Group of Entities

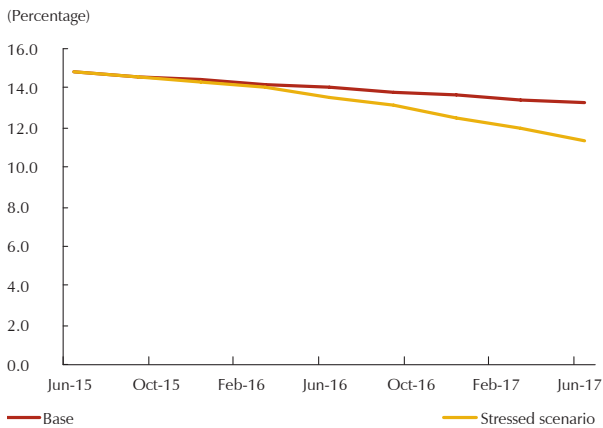
A. Banks



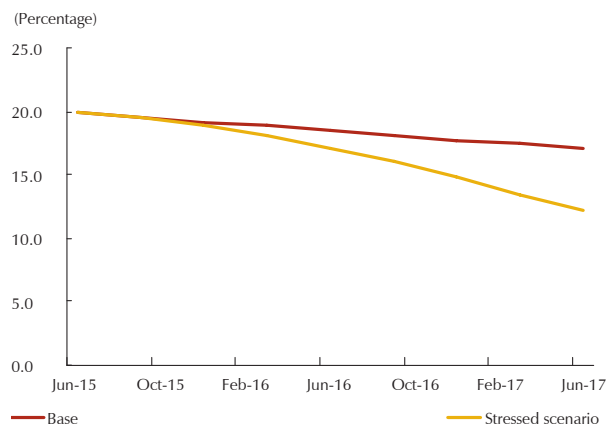
B. Financial Corporations



C. Commercial Financing Companies



D. Financial Cooperatives



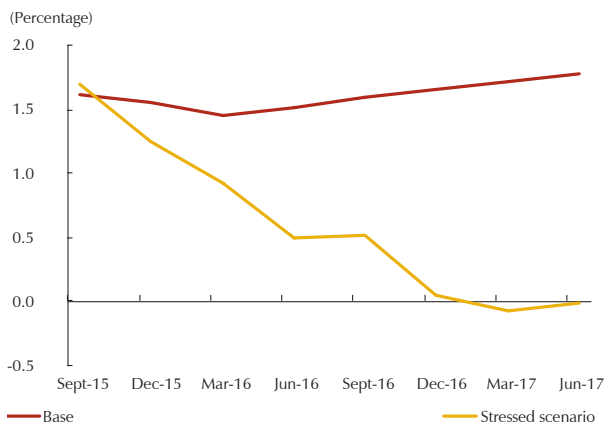
Source: Calculations by Banco de la República.

them, restoring their solvency to the regulatory minimum, is 1.45% of the total equity of the financial system<sup>60</sup>.

Graph 38 shows the evolution of the RWA growth rate for the whole financial system in the scenarios considered. In the base scenario, the RWA maintain a relatively stable growth; in the case of the stressed scenario, the RWA suffer a sharp slowdown, which responds exclusively to the lower dynamics of the “non-performing” loan portfolio.

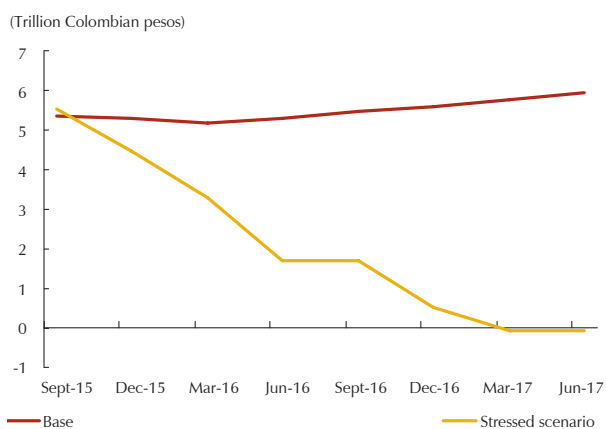
60 This amount corresponds to 0.12% of the projected GDP for 2015. By way of comparison, it has been estimated that the fiscal cost of the bail out of the financial system during the 1998-1999 crisis, amounted to 4.1% of the GDP (H. Cádena. *Crisis financieras en Colombia: ¿qué se ha hecho?* in: *Crisis financiera y respuestas de política*, Fedesarrollo, 2002).

**Graph 38**  
Risk-Weighted Assets (RWA) of the Financial System Growth Rate



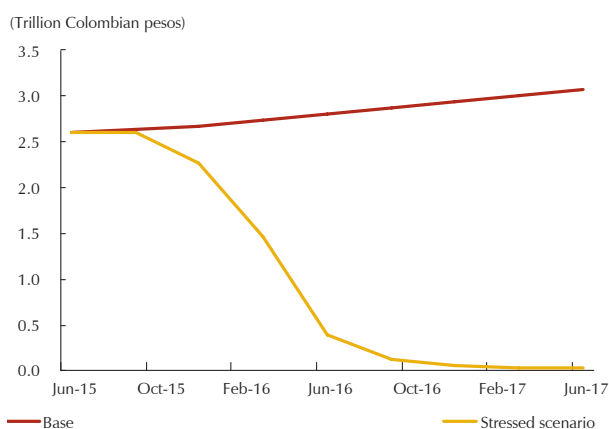
Source: Calculations by Banco de la República.

**Graph 39**  
Profits of the Financial System



Source: Calculations by Banco de la República.

**Graph 40**  
Countercyclical Provisions of the Financial System Reserve Size



Source: Calculations by Banco de la República.

Graph 39 shows the behavior of the financial system profits. While in the base scenario these have a stable trend, a reduction in the stress scenario is observed as a result of the increase in provision expenses.

Finally, Graph 40 shows the evolution of the counter-cyclical provisions “reserve” of the financial system. In the base scenario it increases by construction, to the extent that it is assumed that the entities are in the cumulative phase. By contrast, in the stressed scenario, it is assumed that entities enter in a disaccumulative phase. The graph suggests that the counter-cyclical provisions “reserve” meets the objective of reducing the expenses required in provisions for a period of about eighteen months, after which the reserve is exhausted and the entities must face the full expense in provisions without mechanisms that mitigate it.

The results of the sensitivity test suggest that, faced with a materialization of credit, macroeconomic and funding risks with the discussed parameters, the impact on the financial system would be relatively low, which decreases the incidence of systemic risk in such conditions.

It is important to note that the test described assesses extreme and unlikely scenarios, whose main objective is to quantify the soundness of the financial institutions. In general terms, the results of the proposed tests suggest that in front of the possible materialization of the described risks, the Colombian financial system is not significantly affected.

## Box 4 PRIVATE DEBT MARKET RISK

Wilmar Cabrera  
Oscar Jaulín\*

The debt securities issued by the real and financial sectors (private debt) are one of the sources of funding for entities, and one of the investment vehicles used in the Colombian economy. Currently, 9.6% of the investments of the credit institutions are destined to this kind of securities, while on the side of the proprietary position of non-banking financial institutions, this percentage amounts to 37.1%. Given the participation of private debt securities in the portfolios of the financial intermediaries and the guidelines of the market risk management system (SARM in Spanish) of the Office of the Financial Superintendent of Colombia (FSC) about the consideration of these securities in this scheme, it becomes relevant to include the potential losses entities could face in an scenario of loss of value in these positions in the market risk analysis presented in previous versions of the Report. This box shows the features of the private debt test that was included in this Report.

The sources of information used are the investments portfolio composition format (format 351) of the FSC, along with the valuation files by *Infovalmer*, price provider. The first source offers the information about the investment portfolio of each entity, and the second, the necessary information to assess this portfolio<sup>1</sup>.

The calculation takes the nominal value of format 351 investments and projects the flows of these securities using the coupon rates or spreads on the references to which these titles are tied (mainly DTF, IBR or CPI). Subsequently, following *Infovalmer's* methodology, the price of each of these securities is calculated as follows:

$$P = \frac{\sum_{i=1}^N \frac{F_i}{((1+TR_{ni}(1+M))^{\frac{ni}{365}})}}{VN} = \frac{VP}{VN}$$

where the  $P$  price is the relationship between the present value ( $VP$ ) and the nominal value ( $VN$ ),  $F_i$  is the  $i$ th flow,  $TR_{ni}$  is the value of the benchmark rate corresponding to the maturity dates of the  $i$ th flow ( $ni$ ), and  $M$  is the margin (it recognizes the different risks not incorporated in the benchmark rate). With respect to the benchmark rate, it is important to consider the following:

If the security is associated to a curve for the discount, the benchmark rate for each flow corresponds to the point of the corporate zero-coupon curve expressed in effective annual terms, which is determined according to the maturity days<sup>2</sup>.

If the security is not associated to a curve for the discount, the benchmark rate corresponds to the value of the index that is pegged to the coupon of the security at the date of valuation expressed in an effective annual way.

After calculating the market value of the private debt securities, we proceeded to evaluate a hypothetical scenario of decreases in the value of the portfolio. Specifically, following the shock proposed for public debt by the Basel banking supervision committee<sup>3</sup>, a 200-basis point increase in the margin of all securities was assumed, and the difference in the valuation of the portfolio was found:

$$Losses = \sum_{i=1}^L VN_i (p_i^e - p_i)$$

where  $L$  is the number of securities in the portfolio,  $VN_i$  is the nominal value and  $(p_i^e - p_i)$  is the change in the valuation of security  $i$ . The results of this measurement and their analysis are found in Chapter III of this version of the Financial Stability Report.

\* The authors are specialized professional and professional at the Financial Stability Department of *Banco de la República*. The views expressed do not reflect those of the Central Bank or its Board of Directors. Any errors or omissions are the sole responsibility of the authors.

1 For more information on the valuation method, please refer to the Methodologies for fixed income valuation manual from *Infovalmer* (*Manual de metodologías para valoración de renta fija de Infovalmer*).

2 *Infovalmer*, according to the type of issuer and group rate to which the security is pegged to, assigns one of five corporate zero coupon curves. Each one is built with securities that meet the following characteristics: Banks-AAA-fixed simple (FS), Banks-AAA-IBR, Banks-AAA-IPC, Financial Sector AAA-FS and Real Sector-AAA-IPC.

3 For further information, see Annex 3 of the document *Principles for the management and supervision of interest rate risk*, 2004. [www.bis.org/publ/bcbs108.htm](http://www.bis.org/publ/bcbs108.htm).

## Box 5

### COUNTER-CYCLICAL CAPITAL BUFFER AND DYNAMIC PROVISIONS IN COLOMBIA: ELEMENTS FOR AN ASSESSMENT OF THEIR JOINT EXISTENCE

Daniel Osorio\*

The agenda of the Ministry of Finance and Public Credit on the subject of convergence to the standards recommended by Basel III includes implementing, in the near future, a scheme of counter-cyclical (CC) capital requirements (Hernández, 2014). This tool will add to an existing set of prudential instruments, which includes a system of dynamic provisions (DP) in operation. Besides Brazil and India, only Colombia will constitute a special case in the international arena, by having the two schemes operating simultaneously (Basten and Koch, 2015; Claessens et al., 2014).

The possibility of simultaneously counting with two prudential tools of a counter-cyclical character, raises the question on how convenient it would be to adopt a CC scheme in Colombia when, in practice, a dynamic provisions<sup>1</sup> scheme operates. The purpose of this box is to provide elements to assess that convenience.

#### 1. Generalities on Counter-cyclical Capital and Dynamic Provisions<sup>2</sup>

The dynamic provisions scheme consists in softening the impact of the constitution of provisions associated with credit risk throughout the cycle on the earnings and losses of financial institutions individually considered (BBVA Research, 2012). The dynamic provisions system in Colombia is based on the tracking of a set of individual indicators of the financial institutions. An institution must make a determined effort in provisions if its indicators reach certain levels according to established criteria. Thus, the dynamic provisions scheme obliges to an individual request of provisions as an individual results consequence.

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\* The author is a junior researcher at the Monetary and International Investment Division at *Banco de la República*. The views expressed do not reflect those of the Central Bank or its Board of Directors. Any errors or omissions are the sole responsibility of the author.

1 This question has also been raised by the International Monetary Fund in its last FSAP for Colombia (IMF, 2013).

2 For detailed descriptions of the countercyclical capital and dynamic provisions schemes, see the rules described in External Circular 100 of 1995 and in Basel Banking Supervision Committee (2010 and 2011).

On its part, the core of the counter-cyclical capital scheme is based on a criterion that determines that financial institutions as a whole are accumulating systemic risk in an excessive manner at a certain time. This criterion should not, in principle, be based on the direct calculation of risk measures (whose nature is pro-cyclical). When the chosen criterion suggests that this is the case, the scheme proposes an increase in the minimum capital requirement to which entities are subject. The counter-cyclical capital scheme obliges to an additional capital requirement as a consequence of aggregate results<sup>3</sup>.

#### 2. The convenience of adopting the counter-cyclical capital scheme given the existence of the dynamic provisions

The decision on simultaneously adopting counter-cyclical capital or dynamic provisions schemes must be based on the analysis of their benefit and marginal cost. The potential marginal benefit of such strategy may correspond to the strengthening of the system from the macro-prudential point of view, as well as in terms of its capability to cope with future episodes of macroeconomic volatility. The marginal cost could reside in the additional distortion that the counter-cyclical capital scheme would have on financial intermediation in a context in which the entities are subject to the constitution of dynamic provisions.

Theoretically, it is possible to establish conditions under which the effects of the counter-cyclical capital and dynamic provisions schemes on the financial stability are equivalent (or substitutes), and therefore adopting one, given the existence of the other, is irrelevant. Nevertheless, such conditions are very restrictive and unlikely in reality. In practice, the two schemes have complementary effects on financial stability. Therefore, it is expected that the adoption of the counter-cyclical capital scheme will contribute to the counter-cyclical function that the dynamic provisions system currently plays.

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3 The exact criteria to be applied in the Colombian case is not yet defined. Basel III proposes using the cyclical component of the ratio between the outstanding credit loan portfolio, and the gross domestic product (GDP).

### 3. The conditions required for the equivalence between counter-cyclical capital and dynamic provisions

First, the equivalence between the counter-cyclical and dynamic provision schemes demands assuming that the financial system is composed of a single entity. As described, the dynamics provisions scheme is applied on indicators for individual entities, while the counter-cyclical capital proposal is applied on indicators for the entire system. If there is a single entity, the two approaches are equivalent; if that is not the case, it is possible that the heterogeneity of the entities obliges any of them to face dynamic provision requirements, without the whole system having to respond in the form of counter-cyclical capital.

Secondly, it is necessary to assume that there is a single source of disruption to financial stability coming from credit loan portfolio associated risk. In this scenario, the effects of the dynamic provisions and counter-cyclical schemes would be similar, since they aim, in principle, to a sole risk source. However, if it is assumed that there are different sources of risk that may affect financial stability, the schemes would have different effects as long as the dynamic provisions exclusively address credit risk management, while the counter-cyclical capital allows to constitute a buffer *vis-à-vis* the materialization of any alternative risk, even in the case in which the criterion by which the counter-cyclical capital reserve is constituted responds to market trends of the credit market.

Thirdly, it is necessary to assume that the weights in the calculation of risk weighted assets (RWA) remain constant, as well as there are no alternative assets to the loan portfolio, so that the counter-cyclical capital scheme obliges to an increase of the marginal cost of the banking activity as the dynamics provisions scheme does (otherwise, the counter-cyclical capital requirement could be mechanically achieved by means of a reduction in risk measurement or by a recomposition of the assets).

### 4. Arguments in favor of the complementarity between counter-cyclical capital and dynamic provisions

This analysis suggests that counter-cyclical capital and dynamic provision schemes are equivalent under very restrictive conditions, unobservable in practice. On that basis, it is arguable that, in practice, the schemes can potentially act complementarily on financial stability, which makes their joint operation desirable.

The first argument has to do with the prudential nature of the instruments under consideration. The counter-cyclical capital scheme is essentially macro-prudential, as it evaluates the rate at which the aggregate financial system adopts potentially systemic risks that can have significant aggregate effects. In responding to accumulation indicators at the individual level, dynamic provisions correspond to a prudential microeconomic tool. The distinction between a macro-prudential tool and a micro-prudential one is important, as the systemic risk is characterized by the presence of externalities between financial institutions: the actions of an individual entity may increase systemic risk, affecting the risk profile of other entities, without these having taken explicit actions in that respect<sup>4</sup>. The presence of these externalities provides a social value to a regulatory policy that, in addition to requiring individual actions by individual risk taking, establishes incentives for reducing the social costs of externalities associated with systemic risk.

The second argument refers to the fact that the prudential tools of counter-cyclical capital and dynamic provisions, contribute to preserve financial stability in a differential way. Specifically, counter-cyclical capital is a safeguard that increases the capacity of the financial system to face negative shocks, while the dynamic provisions scheme acts as a smoothing mechanism of individual surpluses. Thus, the dynamic provisions scheme allows providing soundness and stability to a certain level of hedging in provisions; the counter-cyclical capital scheme demands an increase in hedging, in this case in the form of direct capitalization.

The third argument is that the dynamic provisions scheme is designed to absorb expected losses solely associated with credit risk, while the counter-cyclical capital scheme requires the construction of a buffer that, in principle, serves potentially as a safeguard against the materialization of any risk. In this sense, although the counter-cyclical capital scheme prescribes a criterion to determine the existence of an excessive systemic risk based on the outstanding credit loan portfolio, the scheme keeps an agnostic position on the exact source of risk that may materialize in a financial crisis. On its part, the dynamic provisions scheme does not prescribe any safeguard in events in which a risk outside the credit loan portfolio materializes, in which case the effect on the surpluses does not benefit from any softening mechanism.

Finally, in the case of Colombia, since the scheme of counter-cyclical provisions was established in 2005, its probable limited capability to completely smooth out the cycle in front of a credit shock whose duration is relatively

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4 For a theoretical analysis of this kind of externalities of the systemic risk, see Korinek (2012).

short has been mentioned<sup>5</sup>. Thus, it is conceivable that the adoption of a counter-cyclical capital scheme can serve as a supplement in case that the materialization of this risk requires an additional safeguard against the depletion of the dynamic provisions. In this case, schemes will also complement, especially facing prolonged adverse scenarios on credit risk issues.

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5 See Martínez et al. (2005) and Box 5 of the *Financial Stability Report* of March 2009.



## Box 6 ISLAMIC FINANCE: BASIC FEATURES

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### 1. Introduction

Islamic finance comprises financial contracts designed under the religious parameters set by the Quran and the Islamic legal tradition that emerges from the former. While access to those contracts is permitted to the entire population in the world, mainly the Muslim community has had access to the use of financial services by those contracts. In recent years, Islamic finance has experienced a rapid global growth. According to Di Mauro et al. (2013), Islamic banking is the segment with the fastest growth in the international financial system during the last decade<sup>1</sup>. By the end of 2012, assets managed by Islamic banks (i.e., financial institutions specialized in the use of contracts that comply with Islamic law) amounted to US\$0.992 trillion, slightly less than 1% of the global financial system<sup>2</sup>. Graph B6.1 presents the distribution of such assets in the world: it highlights both the preponderance of mostly Islamic countries (Iran, Malaysia and Saudi Arabia), as the development of Islamic banking in the United Kingdom.

The purpose of this box is to briefly describe the most important features of Islamic finance, as well as to present a series of reflections concerning the benefits and the challenges that its development poses to public policy and financial stability.

### 2. Features and main instruments

Islamic legal tradition raises three basic principles to be respected by financial contracts. It should be noted that since the establishment of Islam in the seventh century A.D., Islamic law has been dynamic, and continues to evolve and be reinterpreted according to economic and social transformations.

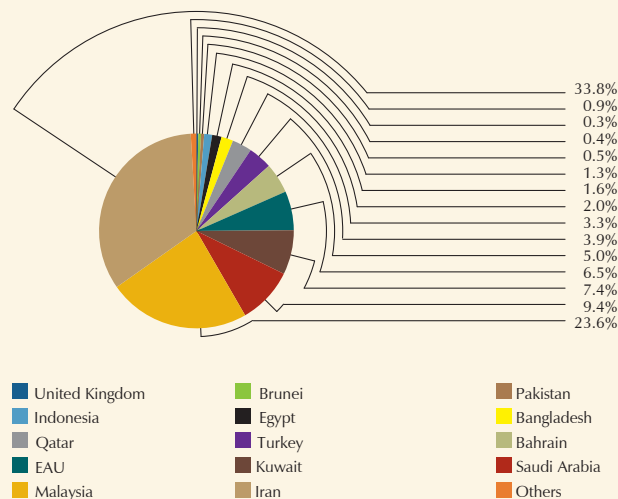
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1 Islamic Banking grew at an annual rate between 15% and 20% between 2008 and 2013.

2 Sources: Islamic Banking Database and World Bank.

**Graph B6.1**  
Asset Distribution of Islamic Banking at a Global Level



Sources: Islamic Banking Database and World Bank.

The first and most well-known principle is the prohibition of charging interest, understood as a gain or a fixed payment independently from the outcome of the project in which the resources provided are invested. This principle has been widely understood as an explicit prohibition of debt contracts, prevalent in traditional finance<sup>3</sup>.

The second principle consists of the prohibition of businesses based on excessive uncertainty, speculation, or both. Islamic tradition recognizes the inherent uncertainty in any social relationship but proscribes financial contracts whose principle is precisely to exploit this uncertainty. Examples of these contracts are bets and traditional insurance schemes.

Finally, Islamic law establishes the principle of a risk-sharing fairly between the participants in a contract. Naturally, Islam recognizes the importance and the need to transfer resources among economic agents; this principle allows, then, lending and investment operations, as long as the compensation of the involved parties fairly shares the obtained benefits. A key element of this principle is that these benefits must come from a real economic activity.

The vanguard of the recent growth of Islamic finance has been precisely the creation (or adaptation) of financial

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3 The prohibition of interest in Islamic law has similarities with the usury prohibition in other monotheistic religions.



instruments that meet these basic principles. In practice, according to the dynamics of the law, there is a vibrant debate about the degree to which such instruments comply with Islamic precepts. From the point of view of the liabilities of Islamic banks, the development of instruments of custody (without interest) has allowed the expansion of contracts similar to deposits. The biggest challenge has been developing financing contracts on the asset side of the entities.

Table B6.1 shows the characteristics of some of the most common credit instruments used by Islamic banking, as well as a comparison with the characteristics of a similar traditional loan. An important element that emerges from the Table –remarked by Jobst (2007)- is that Islamic instruments can be understood as synthetic of traditional instruments contractually designed to respect religious precepts. In this sense, they are conducive to be included within traditional financial system regulation.

Finally, capital and Islamic insurance markets have flourished thanks to the creation of analogue debt securities instruments (*sukuk*) and collective savings schemes (*takaful*). The *sukuk* correspond to property securities over assets, tangible services, projects or investment activities, whose trade is possible under Islamic law. Meanwhile, *takaful* schemes involve the savings of a community in providing resources under the idea, promoted by religion, on the importance of community support.

### 3. Islamic finance and financial inclusion

Empirical evidence suggests that the presence of Islamic banking in countries with a strong presence of Muslim communities increases financial inclusion (World Bank, 2014) as a result of the greater incentive that believers have in participating in financial contracts. In the case of Colombia, there are no Islamic banks or Islamic windows in conventional banks, as in the case of global banks operating in developed economies. The Muslim community in Colombia, amounting in 2009 to about fourteen thousand citizens (Pew, 2009), performs contracts outside the financial system, or using traditional banks with informal mechanisms which respect the religious law (for example, using deposit accounts without using the corresponding interest income).

### 4. Challenges of monetary and regulatory policy Monetary and regulatory challenges

Recent experience indicates that the growth of Islamic finance has brought a number of benefits to the economy. In addition to enabling greater financial inclusion, there is empirical evidence to suggest that Islamic banks have lower incidences of defaults and higher liquidity buffers<sup>4</sup>. A potential benefit that has been widely exploited in

4 Although this high liquidity may be a consequence of the lack of projects or investment instruments that comply with Islamic law.

Table B6.1  
Islamic Credit Instruments Vs. Traditional Credit

Instrument	Issuance	Compensation payment	Maturity
Traditional credit	The bank lends \$ 100 for a year to a debtor. who purchases an asset	The debtor receives benefits for \$ 10 and pays an annual interest of 8% for a year (\$ 8).	The debtor returns the value of capital (\$ 100)
Mudarah (share of benefits)	The bank and the debtor enter into a contract: the debtor commits to purchase the asset with \$100. received from the bank; a participation form the Bank in the benefits of the project is determined (80%).	The debtor pays 80% of the benefits (\$ 8) to the Bank (there is no payment in case of losses).	The debtor purchases the asset from the Bank.
Murabahah (guaranteed sale with deferred payment)	The Bank purchases the asset and sales it to the debtor on an anticipated price of \$ 108 (payment is deferred until the end of the contract).	The debtor makes use of the capital and obtains benefits for \$ 10.	The debtor pays the agreed price of \$ 108 for the asset. In case of non-payment. the bank keeps the asset.
Ijarah (leasing)	The Bank purchases an asset and leases it to the debtor in exchange of a fee of \$ 8 per year.	The debtor pays a leasing fee to the Bank (\$ 8)	The debtor has the option to purchase the asset

Source: World Bank.

some countries (mainly Bahrain and Iran), is the financing of infrastructure projects which, by constituting an investment in the real sector that requires large volumes of resources, is specifically conducive for channeling resources through Islamic instruments (Di Mauro et al., 2013). This benefit is of particular interest to economies interested in financing infrastructure projects making use of the ample liquidity of banks in countries of an Islamic majority.

The particular characteristics of Islamic finance also pose challenges for the exercise of the monetary policy. The main one resides in exercising liquidity control and on the intervention in the money market *vis-à-vis* institutions that cannot deposit or receive loans based on a predetermined interest rate, as modern central banks widely operate. Faced with this difficulty, central banks in Islamic countries have resorted to the direct control of banks and the active use of unpaid bank reserves. In other financial systems (United Kingdom) this restriction has made purely Islamic banks to operate outside the reserves system and for Islamic windows to acquire ascendancy within traditional banks, which have access to the reserves system at a consolidated level<sup>5</sup>.

From a regulatory point of view, a first challenge is to ensure the participation of Islamic banking in the

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5 The United Kingdom has seen the possibility of studying the use of *sukuk* papers in operations with the Bank of England (Di Mauro et al., 2013).

financial system without creating opportunities for regulatory arbitrage *vis-à-vis* traditional institutions. While Islamic financial instruments can be understood as synthetic of traditional instruments, it is necessary in any case, to have an explicit regulation on these so that it does not give them advantages or disadvantages versus the traditional intermediation activity. A parallel challenge is represented by the share of Islamic banking in the traditional deposits insurance scheme, which, being based on a system of insurance premiums, could not cover Islamic entities by principle.

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## IV. FINANCIAL REGULATION

*Between April and September 2015 new measures and changes were implemented in terms of regulation of the financial system. In particular, the main changes and the addition of new regulations were focused on new operations to liquidate and offset the Central Counterparty Risk Clearing House (Cámara de Riesgo Central de Contraparte), mutual funds leveraged, adjustments to the investment regime of some institutional agents and private capital funds, requirements for the establishment and operation of companies specializing in electronic deposits and payments, and a new hedging of the interest rate for housing.*

This chapter recaps the most important local regulatory changes in recent months, both for their impact on the performance of the financial system and its possible implications for financial stability.

### **Decree 1265 of 2015: transactions that are cleared and settled at the Central Counterparty Clearing House**

With the purpose of promoting the development of the securities market and the use of the Central Counterparty Clearing House as an entity that ensures compliance of the transactions carried out in that market, from June 2015 both the set of entities that can act as settlement members<sup>61</sup> and the transactions that are cleared and settled through such entities were extended.

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61 A settlement member is understood as the entity that has direct access to the Central Counterparty Clearing House, through which this will credit and debit the respective accounts in order to clear, settle and ensure, at the Clearing House, accepted operations that are cleared and settled by its means and that have been performed at a securities exchange, a trading system, over the counter market or any contracting mechanism. A settlement member may participate on its own account, that is, in relation to its own operations, or on behalf of not settlement members or third parties.

With regard to the first extension, the new article provides the following<sup>62</sup>:

Operations of parent supervised entities. Parent supervised entities may act as a settlement member of transactions that are cleared, settled or guaranteed in a central counterparty clearing house, which have been traded by its subsidiaries or affiliates, or funds, mutual funds, Special purpose vehicle, trust agreement or third-party portfolios managed by them, provided that such operations are established in the regulations of the respective central counterparty clearing house authorized by the FSC.

Previously, this authorization was only granted to banking institutions<sup>63</sup>. Regarding the set of operations that can be settled and cleared, it was extended from those made with derivative financial instruments and structured products, up to general operations<sup>64</sup>.

#### **Decree 1266 of 2015: mutual funds leveraged type operations**

In order to promote a greater efficiency in the daily operability of mutual funds and, in general, in the fluency of the chains of compliance of the market, this allows funds to perform intraday liabilities operations with the purpose of complying with market operations without these operations being considered of a leveraged nature. This, since they are not part of the leveraged operations, they would not be subject to the existing limit<sup>65</sup>. Specifically, this decree is added to operations already established as of unleveraged nature under article 3.1.1.5.1 of Decree 2555 of 2010, intraday credits and liabilities transactions, sell/buy-back operations and intraday temporary securities transfer that the management company performs to comply operations in the market on behalf of the mutual fund.

Finally, in order to provide legal clarity to the enforcement of intraday trading (credits and repos), it is established that these are not included in the prohibitions by which mutual funds management companies cannot perform certain activities<sup>66</sup>.

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62 Article 2.35.1.3.2 of Decree 2555 of 2010.

63 It is now extended to a larger set of sectors that can be clearing members, such as financial corporations and stock brokerage firms.

64 To the extent that they are authorized by the regulations of the Clearing House, including those for the clearing of simultaneous operations.

65 The exposure of operations of a leveraged nature cannot exceed 100% of the equity of the mutual fund.

66 Article 3.1.1.10.1 of Decree 2555 of 2010.

### **Decree 1385 of 2015: investment regime of mandatory pension and severance funds, insurance companies, and capitalization companies**

In order to encourage the participation of institutional investors in financing infrastructure projects developed in accordance with the public-private partnerships (PPPs) scheme, under the investment regime of such investors, with a determined limit, investments in private equity funds that will destine, at least, two thirds of the contributions of its investors to infrastructure projects within the APP framework were initially admitted (Decree 816 of 2014). Yet, investments in those funds that had securities issued from their members within their portfolio (even if complying with the APP scheme condition) were still restricted.

With the new Decree 1385 of June 2015, more alternatives to finance projects with resources from institutional investors are considered. This time, it is seek to allow investments in private equity funds that invest in assets, shares and securities whose issuer, acceptor, guarantor, or owner is the institutional investor, the branches, or its subsidiaries, its parent company or affiliates, or its subsidiaries, provided that such private equity funds have the investment feature described in infrastructure projects (i.e.: that they allocate at least two-thirds of the contributions of their investors in infrastructure projects in the APP scheme described in Act 1508 of 2012). Accordingly, the decree excludes the mentioned operations from the investment limit <sup>67</sup>.

Also, in order to limit potential conflicts of interest that previous authorizations may generate, the decree establishes the following additional conditions. On the one hand, to give independence to who is in charge for making investment decisions. For this, it is stated that “[...] the manager of the private equity fund, when having the role of professional manager, or the professional manager, as applicable, and the members of the investments committee who have the status of independent from the pension and severance funds manager (insurer or capitalization company)”. On the other hand, it seeks to diversify the investors base in the private equity fund, establishing that “[...] the sum of the shares of the funds managed by the pension and severance funds manager, of the pension and severance funds manager and of its linked parties [...] is less than fifty percent (50%) of the value of the equity of the private equity fund”.

Besides, the new decree adjusts the rating requirements for eligible investments from institutional investors regarding securities issued abroad from domestic issuances, making that the admissibility requirement does not exclusively depend on modifications to public debt rating. Previously, the securities issued abroad were admissible when “[...] they have a rating

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<sup>67</sup> Literal d of Article 2.6.12.1.15, and paragraph b of Article 2.31.1.12 of Decree 2555 of 2010.

not below to the highest risk one assigned to the external public debt of Colombia by an internationally recognized rating agency”. This decree states that securities will also be eligible “[...] when they are rated with a no lower than the investment grade granted by an internationally recognized rating agency”. Finally, it is clarified that issuances that are rated no lower than investment grade, given by a risk rating agency authorized by the FSC will also be admissible.

### **Decree 1491 of 2015: regulations on companies specializing in electronic deposits and payments**

Since last year, the government has been carrying out a series of legislative initiatives with the aim of promoting financial inclusion in the country. In the September 2014 issue of the Financial Stability Report, some of these initiatives were highlighted within the frame of the national strategy for financial inclusion, among which the bill to create a new financial license that would allow the birth of specialized entities in payments, savings and deposits was included. Indeed, in October of that year, Act 1735 of 2014 was issued for the purpose of promoting access to transactional financial services through the creation of companies specializing in electronic deposits and payments (Sedpe in Spanish). These entities have the sole purpose of taking deposits through electronic deposits, to make payments and transfers, and to send and receive bank drafts. However, they are not authorized to grant credits or any other form of financing.

The law also states that these entities will be monitored by the FSC and will count, based on the stipulated in 2014, with a minimum capital of \$5,846 million, which will be annually adjusted to the consumer prices index (\$6,012 million in 2015), and they may be constituted as individual or juridical persons. This includes, among others, postal payment operators, telecommunication companies and utility companies that, according to the provisions of the legislator, will provide the possibility of having new providers of transactional products, increased competition in the sector and, hence, greater opportunities for consumers.

The Sedpe must comply the same requirements as the other financial institutions to prevent money laundering and financing of terrorism, and those applicable from the Organic Statute of the Financial System – Estatuto Orgánico del Sistema Financiero (Decree 663 of 1993). The funds taken by the Sedpe are covered by deposits insurance from Fogafin and might make use of correspondents for the development of their corporate purpose. Additionally, withdrawals or the disposal of resources of these deposits will be exempt from the tax on financial transactions.

Decree 1491 regulates Act 1735, which describes in its first chapter the general aspects of the electronic deposit, while in the second chapter explains the simplified procedure for the opening of such deposits for individuals. The third chapter explains the ordinary procedure for opening and, finally, sets the rules applicable to that class of companies on issues such as leverage, total regulatory capital and cash management.

Specifically, a minimum leverage ratio of 2% is established, which is defined as the value of total regulatory capital over the value of the average balance of electronic deposits at the daily close of operations in the last thirty days.

**Regulation focused on promoting the real estate market: Decree 1403 of 2015 the Ministry of Finance and Public Credit and Decree 1581 of 2015 of the Ministry of Housing, City, and Territory.**

One of the Government's priorities has been to promote the development of the real estate sector in Colombia given its importance for social welfare in the country. To this extent, between March and September this year, two decrees were issued with this purpose. The first, Decree 1403 of 2015 of the Ministry of Finance and Public Credit, authorizes private equity funds to allocate up to 100% of the contributions of investors to the investment in assets of a real estate nature, preserving their quality of private equity funds, since it is considered that the profile of the investors of these vehicles is higher than the one of users of a traditional mutual fund. This should allow for a greater availability of resources towards this sector.

On its part, Decree 1581 of 2015 of the Ministry of Housing, City and Territory, regulates the conditions and terms on which the hedging of the interest rate provided for in Article 123 of Act 1450 of 2011 must be granted in order to finance one hundred and thirty thousand family housing subsidies to be awarded under the program "Mi Casa Ya"<sup>68</sup>, targeting households who benefit from the subsidy referred on Decree 0428 of 2015. The funding will be done through the Mortgage loan portfolio stabilization fund (*Fondo de Reserva para la Estabilización de Cartera Hipotecaria - Frech*), administered by the Central Bank, and the new coverages will be applicable to the urban new social interest housing segment<sup>69</sup>.

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68 Article 8 of Resolution 1450 of 2015 of the National Housing Fund (*Fondo Nacional de Vivienda*) indicates that the number of available coverages will be of up to 130,000 between 2015 and 2018.

69 Urban new social interest housing is that whose value exceeds seventy monthly minimum legal wages (SMMLV in Spanish), and does not exceed or is equal to one hundred and thirty five SMMLV; which is in a project, presale stage, or in construction and that, being completed, has not been inhabited

The hedging consists of a calculated financial swap on the agreed interest rate on new loans granted by credit institutions to debtors who meet the eligibility conditions set out in the decree. The hedging will only apply during the first seven years of the loan period, counted from the date of disbursement of the credit.

The financial swap consists in an exchange of flows that occurs when the credit institution delivers to the Frech, “Mi Casa Ya” program, the monthly equivalent of the agreed interest rate in the loan, discounting the amount corresponding to the coverage, and in turn Frech-“Mi Casa Ya” gives the monthly equivalent of the agreed interest rate in the loan to the credit institution. As for operations in Real Value Units, the monthly equivalent of the interest rate agreed in the credit will be converted to its equivalent in Colombian pesos.

The hedging provided corresponds to 4 percentage points settled on the remaining balance of the loan granted by the credit institution to finance the purchase of housing that meets the conditions set out under the frame of the “Mi Casa Ya” program. The debtor or the debtors of the credit that benefits from the hedging, during its term, will pay monthly the share along with the monthly equivalent of the interest rate agreed for the respective period to credit institutions, minus the amount corresponding to hedging. In the case of operations in Real Value Units, the equivalent of the interest rate agreed in the credit will be converted into Colombian pesos.



Box 7  
FACTORING IN THE REAL AND FINANCIAL SECTORS IN COLOMBIA:  
REGULATION AND CHARACTERIZATION

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This box features a review of the current state of Colombian legislation regarding factoring as well as its recent dynamics at the entities of the financial system that reported information on these activities on their balance sheets as of December 2014 <sup>1</sup>. The box is divided into three parts. First, a definition of factoring according to the provisions of current legislation is presented. Then, a brief and general summary on what the legal doctrine in Colombia covers about these operations. Finally, the evolution and current situation of the activity in the financial system is described and conclusions are presented.

It is important to note that, although this activity has proved to be an important source of funding and immediate liquidity in the real sector, currently there are not enough data to make a description and characterization for companies in Colombia. However, it is expected that with the advancement in regulation matters this study can be extended, counting with the real sector characterizing factoring activities.

### 1. Definition of factoring and modalities

According to Decree 2669 of 2012, a factoring operation is “that by which a factor acquires, for consideration, certain equity rights, of a credit content, regardless of the security containing them or their cause, such as, but not limited to, including: sales invoices, promissory notes, bills of exchange, among others”. In other words, factoring

can be understood as a financial contract in which three agents interact: supplier, buyer and the broker who performs the operation, assuming a scenario in which the first agent transfers a good or service to the second, generating an invoice as proof of the transaction. Factoring activity emerges as an opportunity to solve the problem that the supplier expects immediate liquidity (payment), but the buyer cannot grant it to him at the time of the sale (transaction). Accordingly, the first goes to an intermediary (factor or factoring company) and transfers him the right to collect this obligation in exchange of receiving the expected resources of the operation. According to Act 1231 of 2008, the invoice generated by the supplier to the buyer, serves as a funding mechanism, and defines the relevant aspects of the transaction and the obligations of the involved parties.” <sup>2</sup>

Currently there are two types of factoring (according to Decree 2669): with recourse and without recourse. The difference lies in the way the factor assumes the risk of collection and in the type of transfer of the credit. In recourse factoring, the factoring company does not assume the risk of collecting the obligations it acquires and that the supplier transfers by the invoice. In case of default, the transferor of the invoice is responsible for the existence and payment of the claims covered by the factoring contract. By contrast, in non-recourse factoring the factor does assume the collection of the loan portfolio and is not backed by the transferor regarding the existence and payment of the claims.

It is important to highlight that the factoring contract may include or offer a set of additional advisory services to the supplier regarding administration management and debt collection. For this reason, it is estimated as a financing

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\* The authors are, in this order, specialized professional, and professional of the Financial Stability Department at *Banco de la República*. The views expressed do not reflect those of the Central Bank or its Board of Directors. Any errors or omissions are the sole responsibility of the authors. The contribution and review by Astrid Liliana Pinzón, officer of the Special Supervision Group of the Superintendence of Companies, on the content of the first two sections of this document, and by Andrés Felipe Londoño Rodríguez, officer at the FSC is much appreciated.

1 No information is available as of 2015 factoring operations, since with the entry into force of the international financial reporting standards on the first of January 2015, it is not allowed to identify these operations.

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2 On its part, the FSC, in the legal concept “*Contratos de factoring y de descuento, diferencias*”, “factoring and discount contracts, differences”. (*Concepto* 2012042354-002 in *Boletín Jurídico* num. 39 of August 22, 2012) defines factoring as: “... the legal act that is implemented through the loan portfolio sale between an individual or legal person (hereinafter the client) and a factoring company, which undertakes to supply liquidity to the first, via financing. This contract involves the provision of a set of services by the factor, such as administration and subsequent collection of the securities transferred to him once the term has expired”. It is important to note that, in turn, said concept mentions that both factoring and discount “do not have a legal definition nor have a particular legal regime”; however, it provides definitions as established under the legal doctrine.

alternative and of financial inclusion, and its proper understanding and characterization is of vital importance.

## 2. Factoring legal framework in Colombia

Since factoring is an atypical contract, which does have a specific legal regime governing its content in full and, especially, the obligations of the parties, a general legal framework on which these operations are governed will be presented next.

The main aspect in regulation regarding factoring in Colombia is provided by Decree 2669 of 2012, which determines its scope, purpose, method of operation and issues related to its supervision, monitoring and control. Thus, the decree covers factoring companies organized as commercial companies, and which are not under the supervision of the FSC or the *Superintendencia de Economía Solidaria*, provided they have the factoring activity as their exclusive corporate, and comply with the stipulated number of operations. In turn, it introduces legal definitions of the different types of factoring, direct and indirect operations of this activity, as well as other relevant provisions, such as the delimitation of resources to perform such activities<sup>3</sup>.

Additionally, Decree 2669 of 2012 announced the creation of a Single National Registry of Factors (RUNF), with the aim that all the financial statements for each financial year and other relevant information of factoring companies be published there, and which will be a public access file system. This would pursue consolidating a comprehensive database of companies engaged in factoring who meet the criteria to be supervised by the *Superintendencia de Sociedades* in order to know their most relevant financial information.

The functions of inspection, monitoring and control of loan portfolio purchase commercial companies (factoring) will not be executed by the FSC but will be subject to the general provisions on monitoring and control of commercial companies and the issuance and offering of securities, according to Act 35 of 1993. Indeed, as established by Decree 1219 of 2014, it is the faculty of the *Superintendencia de Sociedades* to conduct surveillance activities over factoring companies that meet the following conditions: 1) to be constituted as commercial companies whose corporate purpose is exclusive in factoring or loan

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3 It is important to clarify that the other companies that perform factoring activities, even if their purpose is not only in this activity, will continue to be supervised by *Superintendencia de Sociedades*, as well as the financial institutions engaged in such activities will continue to be monitored by the FSC.

portfolio discount activities, and 2) that by the closing of the previous year (December 31), the amount of such activities has been equal to or greater than 30,000 monthly minimum legal wages (SMMLV), or that they have agreed or have existing specific mandate contracts with third parties for the acquisition of invoices.

In order to facilitate the operational management of the invoice, Act 1231 of 2008 dictates certain provisions in this matter. For the parties involved in an operation that use it as a funding mechanism, this law unifies the invoice as a security, and specifically determines what this must include and comply regarding acceptance, circulation, and transfer requirements.

Likewise, Article 8 points at two important aspects. First, companies in the real sector and individuals engaged in activities of factoring, loan portfolio buy and sale services, or both, at the discount will be subject to what is stated in Article 103 of the Organic Statute of the Financial System, which regulates the parameters that every financial institution must comply with and implement when making cash transactions. Thus, companies focused on factoring must implement measures, methodologies, and procedures to prevent money laundering. Second, it states that only legally registered entities at the chamber of commerce can develop discount loan portfolio purchase activities.

Finally, Article 89 of Act 1676 of 2013 regulates the companies authorized to perform factoring activities of factoring, with a mandatory solvency limit, since it requires that the value of the invoices to be purchased through contracts with a specific mandate to third parties, does not exceed an amount equal to 10% of the equity of the factor.

## 3. Characterization of the non-recourse factoring and discount businesses for the financial system

As mentioned, the characterization of the factoring activities presented only corresponds to credit institutions reporting this information on their balance sheets as of December 2014. According to the public information from the FSC<sup>4</sup>, the evolution of factoring without recourse

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4 In the Single Accounts Plan applicable to entities under the control, inspection and surveillance of FSC, in force until December 2014, there are accounts for only recording factoring without recourse and discount operations. For this box, it was deduced that the latter has the balances of factoring transactions with recourse, because its definition is close, but not equivalent, to the discount one.

businesses and discount<sup>5</sup> can be monthly described between January 2012 and December 2014. At the end of that period, the total balance of the two modalities was at \$ 3.8 trillion, and grew at an annual real rate of 21, 2%, a figure lower than the one from a year ago (38.4%) and the average of the analyzed period (33.1%). It is worth remarking that its growth rate has shown a marked downward trend since September 2014 (Graph B7.1, Panel A).

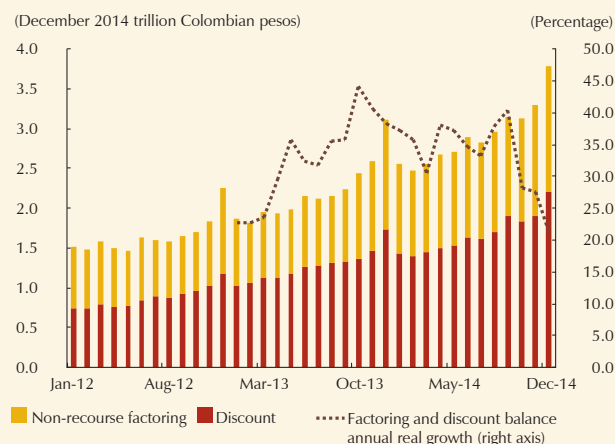
In December 2014, the aggregate balance was distributed in 57.7% in the discount activity and the rest in non-recourse factoring transactions (43.3%). These figures have remained relatively constant and similar to the averages of the analyzed period, 58.4% and 41.6% in that order. By breaking down the amounts by currency, there is a significant concentration on its balance in Colombian pesos (94.8% in average) (Graph B7.1, Panel B).

The accounting management of these activities requires them to be register as loan portfolio lending operations<sup>6</sup>. The total balance of the non-recourse factoring and discount activities has represented on average 0.84% of the total balance of the credit granted by credit institutions for the period studied (Graph B7.2). Additionally, the increasing involvement of this item in the credits loan portfolio of financial intermediaries is worth noting, which started in December 2014 at 1.2%; and the seasonal behavior of the series, where the peaks occur in December each year, mainly due to the liquidity needs of suppliers requiring to discount the invoices to fund their production activity.

In terms of credit risk, the quality risk indicator<sup>7</sup> of factoring operations without recourse and discount, calcu-

Graph B7.1  
Non-Recourse Factoring and Discount Dynamics

A. Real Balance<sup>a/</sup> and Annual Real Growth

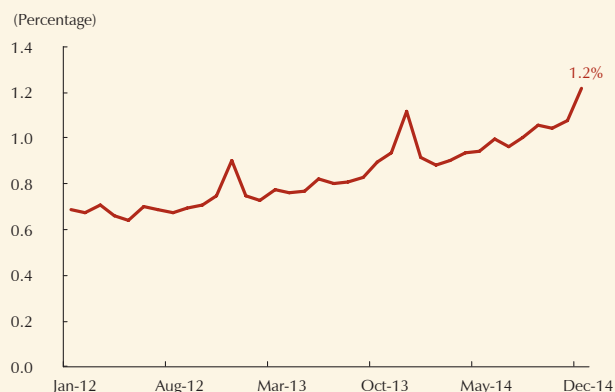


B. Composition by Currency



a/ The balance is net of credit risk provisions.  
Source: Office of the Financial Superintendent of Colombia; authors' calculations.

Graph B7.2  
Aggregate Balance of Non-Recourse Factoring and Discount as Proportion of the Net Loan Portfolio of Provisions from Credit Institutions



Source: Office of the Financial Superintendent of Colombia; authors' calculations.

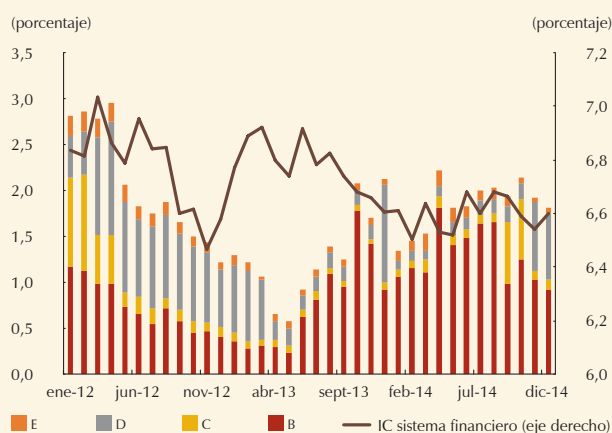
5 Following Concept 2012042354-002, "Contratos de factoring y descuento, diferencias" ("Factoring and discount contracts, differences"), a discount contract is defined as: "a legal act whereby a bank grants a loan to its client, by charging interest in advance and, as consideration, the latter transfer an unexpired credit in charge of a third party, that is enabled by the discounting bank to directly recover the amount delivered. It is then a credit transaction, in which the client gets financing from the bank at the need that of this of getting cash or liquidity. It should be clear that the explained operation can be performed by other entities whose regime so does permits it, because the lending activity is not exclusive to financial institutions subject to the supervision by the Superintendence, provided that it is covered with proprietary resources not collected from the public".

6 Specifically, in the commercial and consumption modalities, for which a balance of \$ 2.8 trillion and \$ 0.9 trillion respectively as of December 2014 is recorded.

7 The risk quality indicator is calculated as the ratio between the risk loan portfolio (the sum of the amounts rated in B, C, D and E) and the gross loan portfolio.

lated on a monthly basis, and taking as input the balance sheet of credit institutions that have participated in these operations, has been consistently lower than the indicator for the total loan portfolio (on average, lower by 4.9 percentage points). In December 2014 the quality indicator for the two activities was at 1.8%, while it was of 6.6%<sup>8</sup> for the financial system. Finally, by breaking the risk loan portfolio by rating, it is found that the greatest contributions have been observed for balances rated as B and D (Graph B7.3).

**Graph B7.3**  
Risk Quality Indicator of the Non-Recourse Factoring and Discount Operations, by Rating and their Comparison with respect to the Quality Indicator of the Loan Portfolio of the Financial System



Source: Office of the Financial Superintendent of Colombia; authors' calculations.

During the period analyzed, and from the information from the balance sheets of credit institutions, 29 entities (from 54 currently belong to the financial system) that were involved in non-recourse factoring transactions and discounts were identified, of which ten concentrated nearly 80% of the average aggregate and current balance (Table B7.1). Mostly, the group of entities was composed of commercial banks, with the participation of some financing companies. Moreover, within the entities that had the highest shares in the business of factoring and discount, there are the two major creditors of the financial system (entities 1 and 3). Additionally, by entity, when calculating the average time of the participation of the outstanding amount of the factoring and discount operations on the balance of the loan portfolio, important participations for most financing companies are found.

#### 4. Conclusion

The regulations on the issue of factoring for commercial companies presented in this box is primarily limited to regulate those that meet specific criteria, such as their exclusive activity is factoring or loan portfolio discount. It is expected that future progress in the regulation will enable having information for all the entities performing this type of activity, in order to establish potential sources of risk to the financial system.

This box characterized factoring in Colombia for credit institutions reporting information from these activities as of December 2014. The results show a low exposure of these agents to their counterparties, measured with the quality indicator. It is noteworthy that recently the dynamics of this business has been decelerating, although its share in the loan portfolio has been growing. Finally, for the period of analysis, it found that over 50% of factoring transactions and discounts have been concentrated in five entities, highlighting the representativeness of these activities within the portfolio of financing companies.

<sup>8</sup> For the consumption and commercial modalities, this indicator was at 6.9% and 6.4% in that order.

Table B2.1

Representativeness in the Factoring and Discount Balance of the Analyzed Sample, in the Loan Portfolio of the Financial System. and Proportion of the Factoring and Discount in the Granted Loan Portfolio, by Credit Institution

Entity	Share in the factoring and discount total (percentage)	Share in the loan portfolio total of the financial system (percentage)	$\frac{(\text{Factoring} + \text{discount})_{\text{entity}}}{\text{Loan portfolio}_{\text{entity}}} \times 100$ (percentage)
Entity 1 (commercial bank)	18.0	21.0	0.7
Entity 2 (financing company)	13.8	0.2	48.6
Entity 3 (commercial bank)	13.1	12.9	0.8
Entity 4 (commercial bank)	9.0	2.2	3.6
Entity 5 (financing company)	8.3	0.2	30.7
Entity 6 (commercial bank)	5.5	3.4	1.4
Entity 7 (financing company)	4.9	0.1	34.5
Entity 8 (financing company)	3.3	0.1	31.7
Entity 9 (financing company)	3.3	0.1	21.7
Entity 10 (commercial bank)	3.0	2.3	1.1
Entity 11 (commercial bank)	2.6	2.9	0.7
Entity 12 (commercial bank)	2.4	4.9	0.4
Entity 13 (commercial bank)	2.3	2.7	0.7
Entity 14 (commercial bank)	1.8	9.1	0.2
Entity 15 (commercial bank)	1.7	6.8	0.2
Entity 16 (commercial bank)	1.3	0.3	3.9
Entity 17 (commercial bank)	1.3	0.0	44.6
Entity 18 (commercial bank)	1.1	0.2	3.8
Entity 19 (commercial bank)	0.9	3.0	0.3
Entity 20 (commercial bank)	0.7	4.5	0.1
Entity 21 (commercial bank)	0.6	0.4	1.2
Entity 22 (commercial bank)	0.6	0.6	0.7
Entity 23 (financing company)	0.5	0.1	2.9
Entity 24 (financing company)	0.1	0.1	0.6
Entity 25 (commercial bank)	0.1	0.4	0.3
Entity 26 (commercial bank)	0.1	0.0	1.7
Entity 27 (commercial bank)	0.0	0.8	0.0
Entity 28 (commercial bank)	0.0	12.0	0.0
Entity 29 (commercial bank)	0.0	2.1	0.0

Note: These figures correspond to the monthly average between January 2013 and December 2014.  
Source: Office of the Financial Superintendent of Colombia; authors' calculations.

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